

ROBO-8719VG2AR

Single Board Computer

User's Manual

Version 1.0

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Appendix A

Appendix B

How to Use This Manual

The manual describes how to configure your system board to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

Chapter 1 : System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

Chapter 2 : Hardware Configuration. Shows the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3 : System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4 : BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5 : Troubleshooting. Provides various useful tips to quickly get its running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. **Portwell** may make supplement or change in the products described in this document at any time.

Updates to this manual, technical clarification, and answers to frequently asked questions will be shown on the following web site : <http://www.portwell.com.tw/>.

Chapter 1

System Overview

1.1 Introduction

Portwell Inc., a world-leading innovator in the Industrial PC (IPC) market and announce a new PICMG 1.0 PCI/ISA SBC (Single Board Computer) ROBO-8719VG2AR which adopts with Intel® GM45 and ICH9ME chipset. It offers flexible FSB up to 1066MHz selection of Intel® Core 2 Quad, Core 2 Duo, Celeron M processors that feature high computing power with lower heat.

ROBO-8719VG2AR supports multiple displays, such as VGA port up to 2048 x 1536 resolution and dual channel 24 bit LVDS port and flexible SDVO connector for other type display via an optional daughter card. It can let users have the other kind of choice for display output.

In addition, ROBO-8719VG2AR supports two 240-pin DIMM memory slot for DDR2 SDRAM up to 4GB, and comes with dual Gigabit Ethernet ports, one parallel port, dual COM ports, one FDD port, three SATA 300 ports (RAID 0,1), one Compact Flash socket, and Six USB2.0 ports. It also equipped with audio codec that supports audio output function via one optional audio card.

Advanced Management Technology (AMT) 4.0 is feature that ROBO-8719VG2AR equipped. This technology provides remote access capability via Intel® Gigabit Ethernet controller. The new technology is a hardware-based solution that uses out-of-band communication for system management access to client systems. Built in Intel® Trusted Platform Module (iTPM) technology that can enhance platform security.

ROBO-8719VG2AR brief specifications:

- Support Intel® Core 2 Quad, Core 2 Duo, Celeron M processors in mFCPGA package with FSB 1066/800/667MHz
- Two 240-pin DDR2 SDRAM DIMM socket, support for DDR2 800/667 DIMMs, up to 4GB system memory
- Intel® GM45 integrated GMA 4500MHD that support DirectX 10, OpenGL 2.0, MPEG-2 hardware acceleration
- Equipped dual Gigabit Ethernet port
- Support one Compact Flash socket, two COM ports, thee SATA ports and Six USB 2.0 ports (dual ports on bracket)

1.2 Check List

The ROBO-8719VG2AR package should cover the following basic items

- ✓ One ROBO-8719VG2AR single board computer
- ✓ One COM port cable with bracket
- ✓ One 4-pin ATX power control cable for backplane connection
- ✓ One Parallel port cable
- ✓ One SATA cable
- ✓ One FDD cable
- ✓ One active CPU cooler
- ✓ One Installation Resources CD-Title

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

- **Main processor**
 - Support Intel® Core 2 Quad, Core 2 Duo, Celeron M processors
 - CPU bus clock: 1066/800/667 MHz
- **Chipset**
 - Intel® GM45 and ICH9ME
- **Main Memory**
 - Support dual channel DDR2 memory interface
 - Up to 4GB DDR2 SDRAM on two 240-pin DIMM socket
- **Bus Interface**
 - Follow PICMG 1.0 Rev 2.0 standard (32-bit PCI and 16-bit ISA)
 - Fully complies with PCI Local Bus specification V2.2 (support 4 master PCI slots)
 - Support ISA function via Winbond PCI to ISA bridge W83628AG and W83629AG
- **System BIOS**
 - AMI BIOS
- **Floppy Drive Interface**
 - Support one FDD port up to two floppy drives and 5-1/4"(360K, 1.2MB), 3-1/2" (720K, 1.2MB, 1.44MB, 2.88MB) diskette format and 3-mode FDD
- **Parallel Port**
 - Support one parallel port with SPP, EPP and ECP modes
- **SATA Interface**
 - Three SATA ports support RAID 0, 1

- **Serial Ports**
Support two serial ports, one is RS232, the other is RS232/422/485 selectable.
- **ATX Power Control Interface**
One 4-pin header to support ATX power control via backplane
- **USB Interface**
Support six USB (Universal Serial Bus) ports (Dual USB ports on bracket)
- **Audio Interface**
 - On board Audio codec via HD Audio interface
 - One optional Audio kit PA-M1AU for Mic in/Line in/Line out.
- **Auxiliary I/O Interfaces**
System reset switch, external speaker, and HDD active LED, etc
- **Real Time Clock/Calendar (RTC)**
Support Y2K Real Time Clock/Calendar with battery backup for 7-year data retention
- **Watchdog Timer**
 - Support WDT function through software programming for enable/disable and interval setting
 - Generate system reset
- **On-board VGA**
 - Intel® GMCH Integrated 4500MHD Graphics device
 - Intel® DVM T 5.0 supports up to 128MB video memory
- **On-board Ethernet LAN**
Intel® 82567LM and 82574L Gigabit Ethernet controller to support two RJ-45 connector on I/O bracket
- **High Driving GPIO**
Onboard programmable 8-bit Digital I/O interface
- **Cooling Fans**
Support two 3-pin header for system fan and one 3-pin header for CPU fan
- **System Monitoring Feature**
Monitor system temperature and major power sources, etc
- **Bracket**
Support dual Ethernet port with 2 indicators, dual USB ports, and one CRT port
- **Outline Dimension (L X W):**
338.5mm (13.33") X 122mm (4.8")
- **Power Requirements:**
Power Consumption test: Run Burning Test V5.3, RUN time: 10 / 30 Minutes.
 - +12V (CPU) @ 1.6A
 - +12V (System) @ 2.0A
 - +5V (System) @ 5.4A

- **Configuration:**

System Configuration	
CPU Type	Genuine Intel® CPU 2.53GHz (T9400 ES) FSB:1066MHz
SBC BIOS	Portwell, Inc. ROBO-8719VG2AR BIOS Rev.: R1.00.E0
Memory	Apacer DDR2 667 2GB*2 (ELPIDA E1108ACBG-8E-E)
VGA Card	Onboard Intel® 4 Series Express Chipset Family
VGA Driver	Intel® 4 Series Express Chipset Family Version 6.14.10.5002
LAN Card	Onboard Intel® 82567LM / 82574L Gigabit Network
LAN Driver	Intel® 82567LM / 82574L Gigabit Network
Audio Card	Onboard Realtek ALC262 High Definition Audio Controller
Audio Driver	Realtek ALC262 High Definition Audio Version 5.10.0.5735
Chip Driver	Intel® Chipset Device Software Version 9.0.0.1009
USB 2.0 Driver	Intel® Family USB2 Enhanced Host Controller
SCSI Card	Adaptec ASC-29160LP
SCSI HDD	Seagate ST39173W 8.47GB
SATA HDD	WD WD1601ABYS 160GB
Compact Flash	Apacer AP-CF256B-Steno 256MB
FDD	MITSUMI D353M3D 1.44MB
CDROM	LITE-ON LH-20A1S
Power Supply	FSP400-60PFN
Back plane	PBP-14A7-A (305)

- **Operating Temperature:**

0°C ~ 60°C

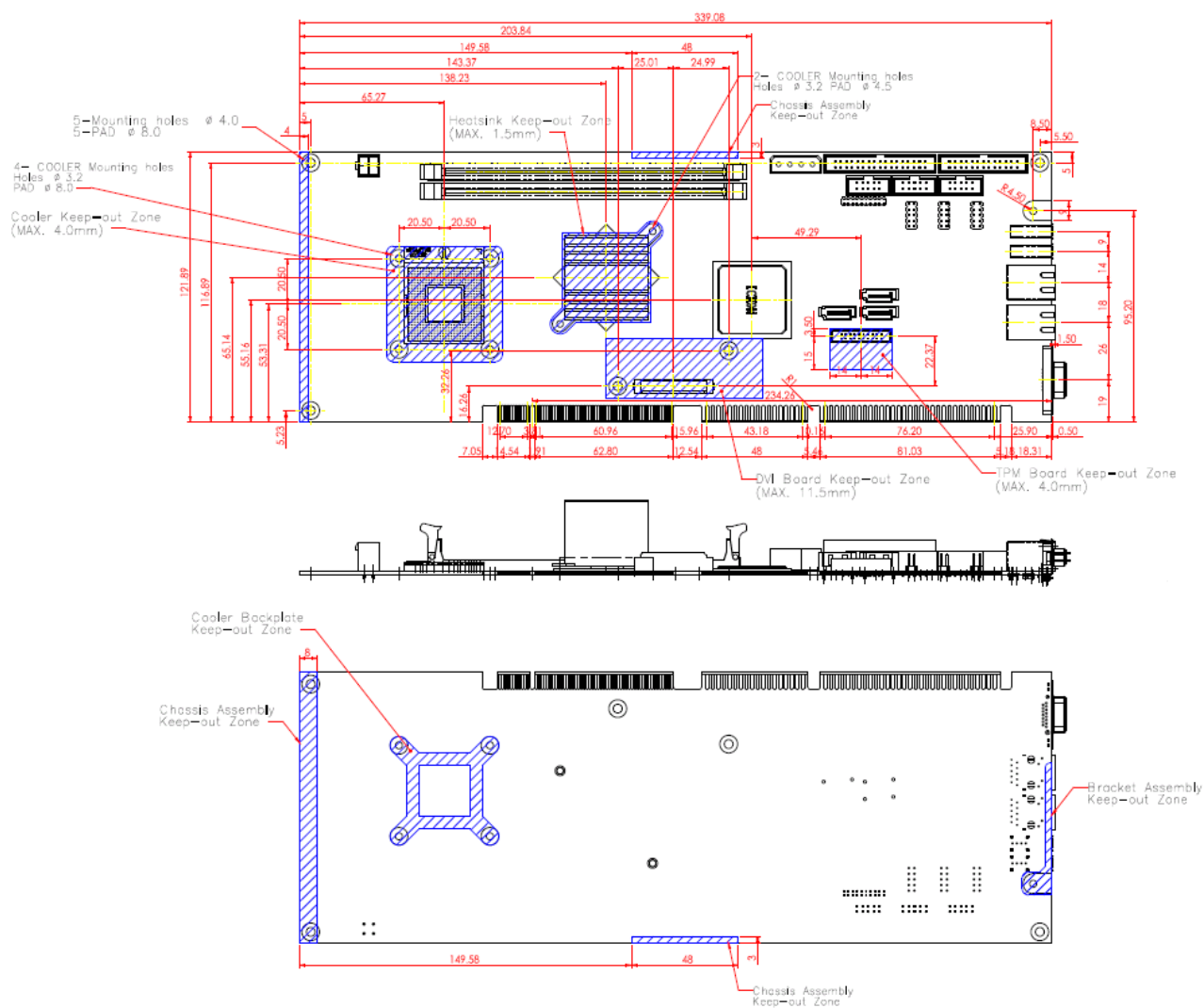
- **Storage Temperature:**

-20°C ~ 80°C

- **Relative Humidity:**

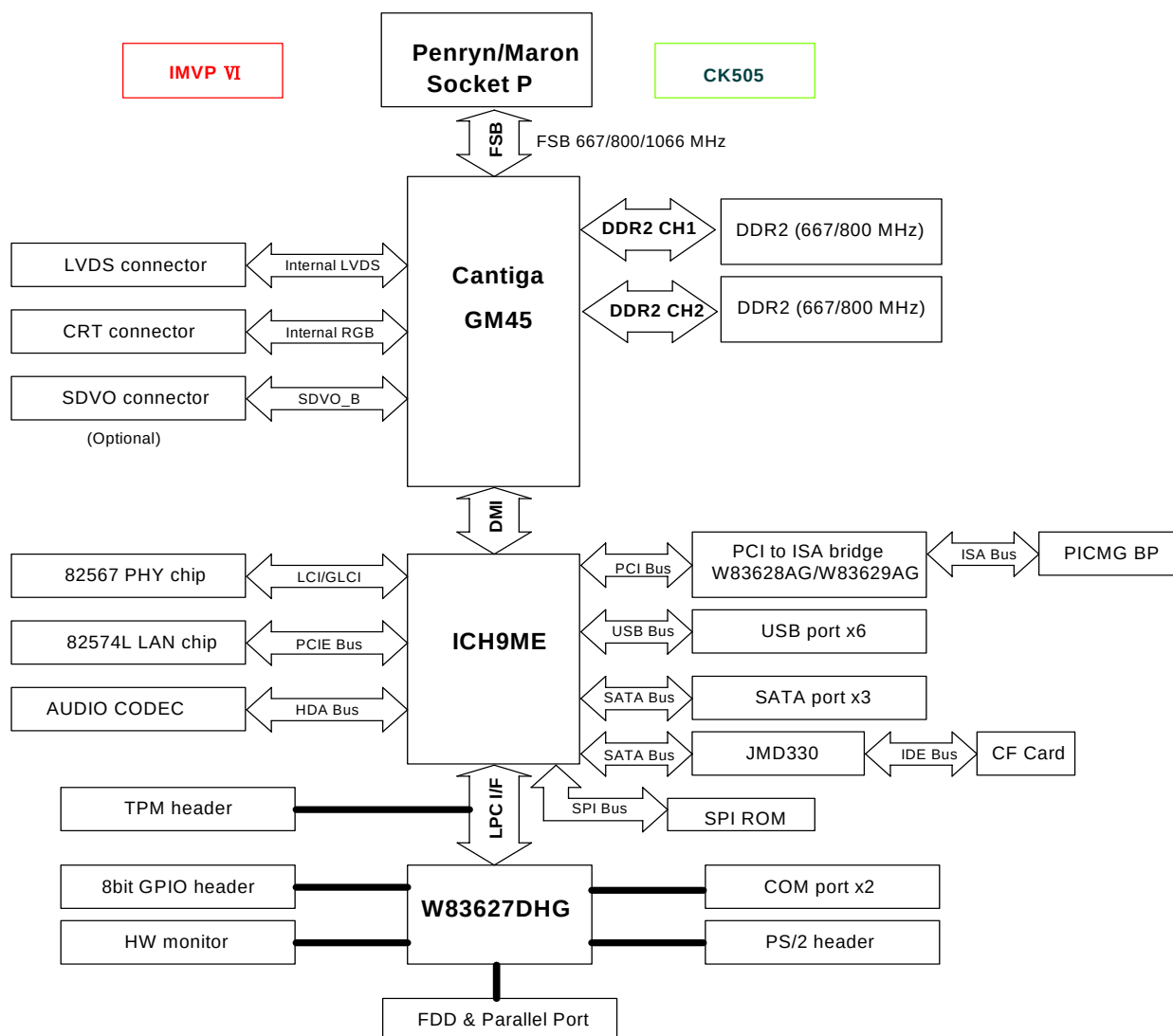
5% ~ 90%, non-condensing

1.3.1 Mechanical Drawing



1.4 System Architecture

All of details operating relations are shown in ROBO-8719VG2AR series System Block Diagram



ROBO-8719VG2AR System Block Diagram

Chapter 2

Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connectors. All of the configuration jumpers on ROBO-8719VG2AR are in the proper position. The default settings shipped from factory are marked with an asterisk (★).

2.1 Jumper Setting

In general, jumpers on the single board computer are used to select options for certain features. Some of the jumpers are designed to be user-configurable, allowing for system enhancement. The others are for testing purpose only and should not be altered. To select any option, cover the jumper cap over (SHORT) or remove (NC) it from the jumper pins according to the following instructions. Here NC stands for “Not Connect”.

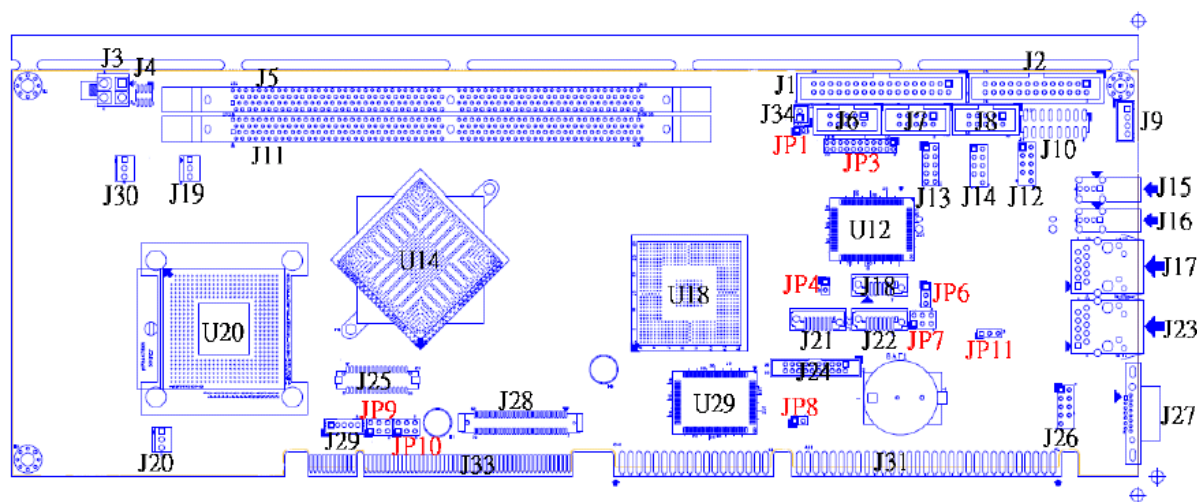


Figure 2-1 ROBO-8719VG2AR Jumper and Connector Locations

JP1 : Auto Power Button selection

JP1	Function
1-2	Auto power button mode

JP3 : COM2 RS232/485/422 Selection

JP3	Function
RS232	5-6,9-11,10-12,15-17,16-18 ★
RS485	1-2,7-9,8-10,19-20
RS422	3-4,7-9,8-10,13-15,14-16,21-22

JP6 : RTC CMOS Clear Jumper Setting

JP6	Function
1-2	Normal Operation ★
2-3	Clear CMOS Contents

JP7 : AT/ATX Power Supply Selection

JP7	Process Selection
3-5, 4-6	ATX Power Supply ★
1-3, 2-4	AT Power Supply

JP8 : TPM Physical Presence

JP8	Function
1-2	TPM Enable★

JP9 : LVDS Back-light Power Level

JP9	Process Selection
1-3,2-4	5V, Active High★
1-3,4-6	12V, Active High
3-5,2-4	5V, Active Low
3-5,4-6	12V, Active Low

JP10 : LVDS Power Level

JP10	Process Selection
1-2	3.3V ★
3-4	12V
5-6	5V

JP11 : CF Power Select

JP11	Function
1-2	VCC3 ★
2-3	VCC

2.2 Connectors

I/O peripheral devices and Flash disk will be connected to these interface connectors.

Connector	Function	Remark
J1	FDD Interface Connector	
J2	Parallel Port Connector	
J3	4P Power Connector for CPU POWER 12V	
J5	DDRII 240pin Slot2	
J6	Serial Port 1 Connector	
J7	Serial Port 2 Connector	
J8	Keyboard & Mouse Connector	
J9	ATX Standby Power Connector	
J10	Miscellaneous Header Pin2-4-6 : Power LED, Pin9-11: Power Button, Pin13-15: Reset Button, Pin14-16 : HDD LED	
J11	DDRII 240pin Slot1 (ME initialization)	
J12/J14	Dual Port USB Connector	
J13	8-Bit GPIO Header	
J15/J16	USB Port 0/1	
J17/J23	RJ45 LAN Port 1/2	
J18/21/22	SATA Interface Connector	
J19	3P FAN Power Connector (System1)	
J20	3P FAN Power Connector (CPU)	
J25	LVDS Connector	
J26	Audio Header	
J27	D-SUB15 VGA Connector	
J28	SDVO Board To Board Connector	
J29	LVDS Panel Back-light Power Connector	
J30	3P FAN Power Connector (System2)	
J31	ISA Golden Finger	
J32	Compact Flash Socket	
J33	PCI Golden Finger	
J34	CASE OPEN detection	

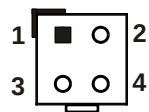
Pin Assignments of Connectors

J1 : FDD Interface Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	DRVDEN0
3	Ground	4	NC
5	Ground	6	LPC_SMI#
7	Ground	8	INDEX#
9	Ground	10	MOA#
11	Ground	12	N/C
13	Ground	14	DSA#
15	Ground	16	N/C
17	Ground	18	DIR#
19	Ground	20	STEP#
21	Ground	22	WD#
23	Ground	24	WE#
25	Ground	26	TRAK0#
27	Ground	28	WPT#
29	N/C	30	RDATA#
31	Ground	32	HEAD#
33	N/C	34	DSKCJG#

J2 : Parallel Port Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Strobe#	14	Auto form Feed#
2	Data 0	15	Error#
3	Data 1	16	Initialization#
4	Data 2	17	Printer Select IN#
5	Data 3	18	Ground
6	Data 4	19	Ground
7	Data 5	20	Ground
8	Data 6	21	Ground
9	Data 7	22	Ground
10	Acknowledge#	23	Ground
11	Busy	24	Ground
12	Paper Empty	25	Ground
13	Printer Select	26	N/C

J3 : 4P Power Connector for CPU POWER 12V

PIN No.	Signal Description
1	Ground
2	Ground
3	+12V
4	+12V

J6/J7 : Serial Port-1/Port-2 Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request to Send (RTS)
5	Transmit Data (TXD)	6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	GND	10	NC

J8 : Keyboard & Mouse Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	L_MDAT	2	L_KDAT
3	N/C	4	N/C
5	GND	6	GND
7	+5V	8	+5V
9	L_MCLK	10	L_KCLK

J9 : ATX Standby Power Connector

PIN No.	Signal Description
1	ATX Power OK
2	ATX_5VSB
3	PS ON
4	GND

J10 : Miscellaneous Header

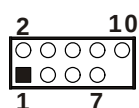
Pin2-4-6: Power LED

Pin9-11: Power Button

Pin13-15: Reset Button

Pin14-16: HDD LED

PIN No.	Signal Description	PIN No.	Signal Description
1	N/C	2	POWER LED+
3	N/C	4	N/C
5	N/C	6	POWER LED-
7	N/C	8	N/C
9	POWER BUTTON -	10	N/C
11	POWER BUTTON +	12	N/C
13	Reset Button +	14	HDD LED +
15	Reset Button -	16	HDD LED -

J12/J14 : Dual Port USB Header**J12**

PIN No.	Signal Description	PIN No.	Signal Description
1	+5V	2	+5V
3	USBD2N	4	USBD3N
5	USBD2P	6	USBD3P
7	Ground	8	Ground
		10	NC

J14

PIN No.	Signal Description	PIN No.	Signal Description
1	+5V	2	+5V
3	USBD4N	4	USBD5N
5	USBD4P	6	USBD5P
7	Ground	8	Ground
		10	NC

J13 : 8-Bit GPIO Header

PIN No.	Signal Description	PIN No.	Signal Description
1	SIO_GPIO0	2	SIO_GPIO4
3	SIO_GPIO1	4	SIO_GPIO5
5	SIO_GPIO2	6	SIO_GPIO6
7	SIO_GPIO3	8	SIO_GPIO7
9	Ground	10	+5V

J15/J16 : USB Port 1/2

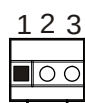
PIN No.	Signal Description	PIN No.	Signal Description
1	+5V	2	+5V
3	USBD1N	4	USBD0N
5	USBD1P	6	USBD0P
7	Ground	8	Ground

J17/J23 : RJ45 LAN Port 1/2

PIN No.	Signal Description	PIN No.	Signal Description
1	L1_MDIP0	1	L2_MDIP0
2	L1_MDIN0	2	L2_MDIN0
3	L1_MDIP1	3	L2_MDIP1
4	L1_MDIN1	4	L2_MDIN1
5	+V1.8_LAN	5	+V1.8_LAN
6	GND	6	GND
7	L1_MDIP2	7	L2_MDIP2
8	L1_MDIN2	8	L2_MDIN2
9	L1_MDIP3	9	L2_MDIP3
10	L1_MDIN3	10	L2_MDIN3
11	+V3.3M	11	VCC3
12	L1_LINK#/ACT#	12	L2_LED0
13	L1_1000#	13	L2_1000#_LED
14	L1_100#	14	L2_100#_LED

J18/J21/J22 :SATA Interface Connector

PIN No.	Signal Description		
1	GND	GND	GND
2	SATA_TXP0	SATA_TXP4	SATA_TXP1
3	SATA_TXN0	SATA_TXN4	SATA_TXN1
4	GND	GND	GND
5	SATA_RXN0	SATA_RXN4	SATA_RXN1
6	SATA_RXP0	SATA_RXP4	SATA_RXP1
7	GND	GND	GND

J19/J20/J30 : 3P FAN Power Connector

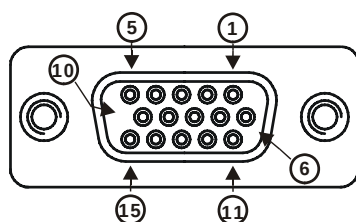
PIN No.	Signal Description
1	Ground
2	+12V
3	Fan Speed Detecting signal

J25 : LVDS Panel Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	LVDSA_DATA0+	2	LVDSA_DATA0-
3	LVDSA_DATA1+	4	LVDSA_DATA1-
5	LVDSA_DATA2+	6	LVDSA_DATA2-
7	LVDSA_DATA3+	8	LVDSA_DATA3-
9	LVDSA_CLK+	10	LVDSA_CLK-
11	LVDSB_DATA0+	12	LVDSB_DATA0-
13	LVDSB_DATA1+	14	LVDSB_DATA1-
15	LVDSB_DATA2+	16	LVDSB_DATA2-
17	LVDSB_DATA3+	18	LVDSB_DATA3-
19	LVDSB_CLK+	20	LVDSB_CLK-
21	5V_LVDS_DDC_DATA	22	5V_LVDS_DDC_CLK
23	Ground	24	LVDS_BKLT_CTRL
25	Ground	26	Ground
27	VDD_LVDS	28	VDD_LVDS
29	N/C	30	VDD_LVDS

J26 : Audio Header

PIN No.	Signal Description
1	CN_MIC
2	AGND
3	CN_LINE-L
4	AGND
5	LINE IN Right
6	AGND
7	CN_LINOUT-L
8	AGND
9	CN_LINOUT-R

J27 : D-SUB15 VGA Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	RED	2	GREEN
3	BLUE	4	ID0
5	Ground	6	Ground
7	Ground	8	Ground
9	NC	10	Ground
11	ID1	12	DDCDATA
13	HSYNC	14	VSNC
15	DDCCLK		

J28 : SDVO Board To Board Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	VCC3	2	V3_DUAL
3	VCC3	4	V3_DUAL
5	VCC3	6	V3_DUAL
7	VCC3	8	VCC
9	VCC3	10	VCC
11	VCC3	12	VCC
13	VCC3	14	+V1.5
15	GND	16	+V1.5
17	SDVOB_R_0	18	+V1.5
19	SDVOB_R_1	20	GND

21	GND	22	SDVO_TVCLKIN
23	SDVO_CTRLCLK	24	SDVO_TVCLKIN#
25	GND	26	GND
27	SDVOB_G_0	28	GND
29	SDVOB_G_1	30	SDVOB_INT_0
31	GND	32	SDVOB_INT_1
33	GND	34	GND
35	SDVOB_B_0	36	GND
37	SDVOB_B_1	38	SDVO_STALL
39	GND	40	SDVO_STALL#
41	GND	42	GND
43	SDVOB_CLK_0	44	N/C
45	SDVOB_CLK_1	46	GND
47	GND	48	N/C
49	SDVO_CTRLDATA	50	N/C
51	GND	52	GND
53	N/C	54	GND
55	N/C	56	GND
57	GND	58	GND
59	N/C	60	PLT_RST#
61	N/C	62	GND
63	GND	64	N/C
65	N/C	66	N/C
67	N/C	68	N/C
69	N/C	70	N/C

J29 : LVDS Panel Back-light Power Connector

PIN No.	Signal Description
1	Backlight Power (select by JP9)
2	Ground
3	+12V
4	Ground
5	+5V

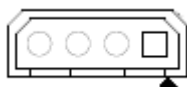
J32 : Compact Flash Socket

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	Data 3
3	Data 4	4	Data 5
5	Data 6	6	Data 7
7	SDCS#0	8	Ground
9	Ground	10	Ground

11	Ground	12	Ground
13	+5V	14	Ground
15	Ground	16	Ground
17	Ground	18	SA2
19	SA1	20	SA0
21	Data 0	22	Data 1
23	Data 2	24	NC
25	NC	26	NC
27	Data 11	28	Data 12
29	Data 13	30	Data 14
31	Data 15	32	SDCS#3
33	Ground	34	IOR#
35	IOW#	36	WE#
37	INT	38	+5V
39	Ground	40	NC
41	RESET#	42	IORDY
43	NC	44	REQ
45	IDEACT#	46	PDIAG#
47	Data 8	48	Data 9
49	Data 10	50	Ground

J34 : Case Open Detection

PIN No.	Function
1	CASEOPEN#
2	GND

ATX1 : Power Head

PIN No.	Function
1	V12
2	GND
3	GND
4	VCC

Chapter 3

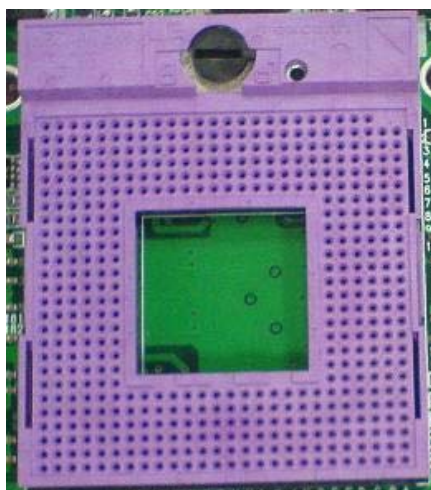
System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

3.1 Intel® mPGA 478MN CPU

Installing Intel® mPGA478MN CPU

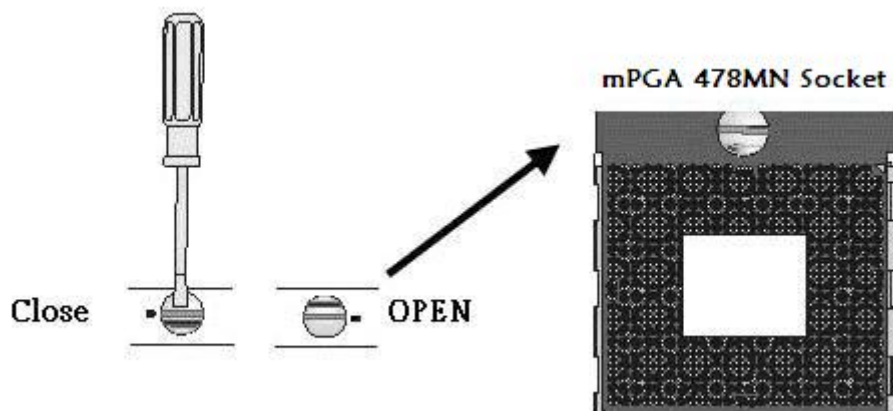
- 1) Lift the handling lever of CPU socket outwards and upwards to the other end.



- 2) Align the processor pins with pinholes on the socket. Make sure that the notched corner or dot mark (pin 1) of the CPU corresponds to the socket's bevel end. Then press the CPU gently until it fits into place. If this operation is not easy or smooth, don't do it forcibly. You need to check and rebuild the CPU pin uniformly.



- 3) Push down the lever to lock processor chip into the socket once CPU fits.



- 3) Follow the installation guide of cooling fan or heat sink to mount it on CPU surface and lock it on the mPGA478MN socket.

Removing CPU

- 1) Unlock the cooling fan first.
- 2) Lift the lever of CPU socket outwards and upwards to the other end.
- 3) Carefully lift up the existing CPU to remove it from the socket.
- 4) Follow the steps of installing a CPU to change to another one or place handling bar to close the opened socket.

CPU Application

Supports Intel® Core 2 Duo 45nm, Celeron® M 45nm, Penryn processor in a 478MN socket equipped with dual core, Hyper-Threading, EM64T, EIST, and XD & VT technologies.

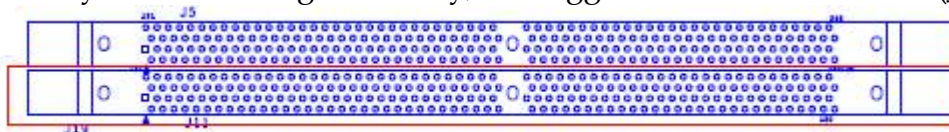
3.2 Main Memory

ROBO-8719 provides 2 x 240-pin DDR2-SDRAM DIMM sockets support 1.8V dual-channel DDR2 800/667 non-ECC DIMMs. The maximum memory size can be up to 4GB. Auto detecting memory clock is according to BIOS CMOS settings.

For system compatibility and stability, don't use memory module without brand. You can also use single-sided or double-sided DIMM in both slots.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install your DRAM module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

PS. When you insert a single memory, we suggest to insert in DIMM 0 (J11).



Dual Channel DDR2 DIMMs

Dual Channel DDR2 memory technology doubles the bandwidth of memory bus. Adequate or higher bandwidth of memory than processor would increase system performance. To enable Dual Channel DDR2 memory technology, you have to install dual identical memory modules in both memory sockets. Following tables show bandwidth information of different processor and memory configurations.

Memory Frequency	Dual Channel DDR Bandwidth	Single Channel DDR Bandwidth
800MHz	25.6 GB/s	12.8 GB/s
667 MHz	21.2 GB/s	10.6 GB/s

Note:

To maintain system stability, don't change any of DRAM parameters in BIOS setup to upgrade your system performance without acquiring technical information.

CPU FSB / Memory Frequency synchronization

Support different memory frequencies depending on the CPU front side bus and the type of DDR2 DIMM. Watch Out, it's meaning that memory maximum frequency on configuration, which is synchronization and based on CPU FSB.

CPU FSB	Memory Frequency
1066MHz	533 / 667 / 800MHz
800 MHz	533 / 667 / 800MHz

3.3 Installing the Single Board Computer

To install your ROBO-8719 into standard chassis or proprietary environment, you need to perform the following:

- Step 1: Check all jumpers setting on proper position.
- Step 2: Install and configure CPU and memory module on right position.
- Step 3: Place ROBO-8719 into the dedicated position in your system.
- Step 4: Attach cables to existing peripheral devices and secure it.

3.3.1 Chipset Component Driver

The chipset on ROBO-8719 is a new chipset that a few old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 2000 /XP / Server 2003, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in ROBO-8719 CD-title.

3.3.2 Intel® Integrated Graphics GMCH Chip

Using GMCH High performance graphic integrated chipset (Intel® GMA 4500MHD) is aimed to gain an outstanding graphic performance. Shared 128 accompany it to 256MB/Maximum system DDR2-SDRAM with Total Graphics Memory. This combination makes ROBO-8719 an excellent piece of multimedia hardware.

With no additional video adaptor, this onboard video will usually be the system display output. By adjusting BIOS of “Advanced Chipset Feature” and set “PEG/Onchip VGA Control” to [PEG Port] (please kindly refer section 4.6 of chapter 4 configuration), and then the add-on PCI or PCI Express by 16 VGA Card can take over the system display.

Drivers Support

Please find hardware driver of GM45 in the ROBO-8719 CD-title. Drivers support Windows 2000 / XP System 32-bit & Windows XP System 64-bit.

Windows 2000/XP (32bit): Please execute Install for Windows 2000/XP System 32-Bit file to start graphics driver installation.

Windows XP (64-bit): Please execute Install for Windows XP System 64-bit file to start graphics driver installation.

3.3.3 On-board Fast Ethernet Controller

Drivers Support

Please find Ethernet combination driver for operating Intel® 82567LM and 82574L Gigabit LAN form ROBO-8719 CD-title. The drivers support Windows 2000/XP System 32-Bit & Windows XP System 64-bit.

Windows 2000/XP (32bit): Please execute Install for Windows 2000/XP System 32-Bit file to start Intel® LAN driver installation.

Windows XP (64-bit): Please execute Install for Windows XP System 64-bit file to “Ethernet\Intel®\Intel®_Gigabit_64bit\”; Pass below button into the dictionary.

LED Indicator (for LAN status)

ROBO-8719 provides three LED indicators to report Intel® 82567LM and 82574L Gigabit Ethernet interfaces status. Please refer to the table below as a quick reference guide.

82566DM	Color	Name of LED	Operation of Ethernet Port		
			Linked	Active	
Status LED	Yellow	LAN Linked & Active LED	On	Blinking	
Speed LED	Orange	LAN speed LED	Giga Mbps	100 Mbps	10 Mbps
	Green		Orange	Green	Off

3.3.4 On-board AC-97 Audio Device

Please find Realtek ALC262 Audio driver of ROBO-8719 CD-title. The drivers support Windows 2000/XP/Server 2003.

3.3.5 Intel® Matrix Storage Manager Device**Drivers Support**

Please find utility tool for Intel® ICH9ME of ROBO-8719 CD-title. The drivers support Windows 2000/XP System 32-Bit & Windows XP System 64-bit.

Installing Serial ATA hard disks

The ROBO-8719 supports Three Serial ATA hard disk drives. For optimal performance, install identical drives of the same model and capacity when creating a disk array.

To install the SATA hard disks for a RAID configuration:

1. Install the SATA hard disks into the drive bays.
2. Connect the SATA signal cables.
3. Connect a SATA power cable to the power connector on each drive.

Intel® RAID configurations

This ROBO-8719 supports RAID 0, RAID 1 and Intel® Matrix Storage configurations for Serial ATA hard disks drives through the Intel® ICH9ME Southbridge chip.

RAID configurations

RAID 0 (Data striping) optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

RAID 1 (Data mirroring) copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

Intel® Matrix Storage Manager. The Intel® Matrix Storage technology supported by the ICH9ME chip allows you to create a RAID 0 and a RAID 1 set using only two identical hard disk drives. The Intel® Matrix Storage technology creates two partitions on each hard disk drive to create a virtual RAID 0 and RAID 1 sets. This technology also allows you to change the hard disk drive partition size without losing any data.

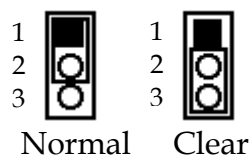
3.3.6 AMT Function Installation

A major barrier to greater IT efficiency has been removed by Intel® Active Management Technology (Intel® AMT) a feature on Intel® vPro™ technology. Using built-in platform capabilities and popular third-party management and security applications, Intel® AMT allows IT to better Discover, Heal, and Protect their networked computing assets.

Installing ME (Management Engine) Drivers (which includes HECI Driver and LMS_SOL Driver) and operating PCI serial port and PCI simple communications controller.

3.4 Clear CMOS Operation

The following table indicates how to enable/disable CMOS Clear Function hardware circuit by putting jumpers at proper position.



JP6	Function
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS contents

3.5 WDT Function

The working algorithm of the WDT function can be simply described as a counting process. The Time-Out Interval can be set through software programming. The availability of the time-out interval settings by software or hardware varies from boards to boards.

ROBO-8719VG2AR allows users control WDT through dynamic software programming. The WDT starts counting when it is activated. It sends out a signal to system reset or to non-maskable interrupt (NMI), when time-out interval ends. To prevent the time-out interval from running out, a re-trigger signal will need to be sent before the counting reaches its end. This action will restart the counting process. A well-written WDT program should keep the counting process running under normal condition. WDT should never generate a system reset or NMI signal unless the system runs into troubles.

The related Control Registers of WDT are all included in the following sample program that is written in C language. User can fill a non-zero value into the Time-out Value Register to enable/refresh WDT. System will be reset after the Time-out Value to be counted down to zero. Or user can directly fill a zero value into Time-out Value Register to disable WDT immediately. To ensure a successful accessing to the content of desired Control Register, the sequence of following program codes should be step-by-step run again when each register is accessed.

Additionally, there are maximum 2 seconds of counting tolerance that should be considered into user' application program. For more information about WDT, please refer to Winbond W83627DHG data sheet.

There are two PNP I/O port addresses that can be used to configure WDT,
1) 0x2E:EFIR (Extended Function Index Register, for identifying CR index number)
2) 0x2F:EFDR (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of WDT.

```
//Enter W83627DHG configuration registers mode
outp(0x2E, 0x87);
outp(0x2E, 0x87);

//Assign Pin77 to be WDTO#
outp(0x2E, 0x2D);
outp(0x2E + 1, inp(0x002E + 1) & 0xFE);

//Select logic device 8
outp(0x2E, 0x07);
outp(0x2E + 1, 0x08);

// Select Count Mode (Minute or Second)
outp(0x002E, 0xF5);
outp(0x002F, (inp(0x002F) & 0xF7) | ( Count-mode Register & 0x08));

// Specify Time-out Value
outp(0x002E, 0xF6);
outp(0x002F, Time-out Value Register );

// Disable WDT reset by keyboard/mouse interrupts
outp(0x002E, 0xF7);
outp(0x002F, 0x00);

// Exit Extended Function Mode
outp(0x002E, 0xAA);
```

Definitions of Variables:

Value of **Count-mode Register** :

- 1) 0x00 -- Count down in seconds (Bit3=0)
- 2) 0x08 -- Count down in minutes (Bit3=1)

Value of **Time-out Value Register** :

- 1) 0x00 -- Time-out Disable
- 2) 0x01~0xFF -- Value for counting down

3.6 GPIO

The ROBO-8719VG2AR provides 8 programmable input or output ports that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of I/O Selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.

3.6.1 Pin assignment

J13 : General Purpose I/O Connector

PIN No.	Signal Description
1	General Purpose I/O Port 0 (GPIO0)
2	General Purpose I/O Port 1 (GPIO1)
3	General Purpose I/O Port 2 (GPIO2)
4	General Purpose I/O Port 3 (GPIO3)
5	Ground
6	General Purpose I/O Port 4 (GPIO4)
7	General Purpose I/O Port 5 (GPIO5)
8	General Purpose I/O Port 6 (GPIO6)
9	General Purpose I/O Port 7 (GPIO7)
10	+5V

All General Purpose I/O ports can only apply to standard TTL $\pm 5\%$ signal level (0V/5V), and each source sink capacity up to 12mA.

3.6.2 ROBO-8719VG2AR GPIO Programming Guide

There are 8 GPIO pins on ROBO-8719VG2AR. These GPIO pins are from SUPER I/O (W83627DHG) GPIO pins, and can be programmed as Input or Output direction.

J13 pin header is for 8 GPIO pins and its pin assignment as following :

J13_Pin1=GPIO0:from SUPER I/O_GPIO30 with Ext. 2.2K PH
 J13_Pin2=GPIO1:from SUPER I/O_GPIO31 with Ext. 2.2K PH
 J13_Pin3=GPIO2:from SUPER I/O_GPIO32 with Ext. 2.2K PH
 J13_Pin4=GPIO3:from SUPER I/O_GPIO33 with Ext. 2.2K PH
 J13_Pin6=GPIO4:from SUPER I/O_GPIO34 with Ext. 2.2K PH
 J13_Pin7=GPIO5:from SUPER I/O_GPIO35 with Ext. 2.2K PH
 J13_Pin8=GPIO6:from SUPER I/O_GPIO36 with Ext. 2.2K PH
 J13_Pin9=GPIO7:from SUPER I/O_GPIO37 with Ext. 2.2K PH
 <<<<< Be careful Pin5=GND , Pin10=VCC >>>>>

There are several Configuration Registers (CR) of W83627DHG needed to be programmed to control the GPIO direction, and status(GPI)/value(GPO). CR00h ~ CR2F are common (global) registers to all Logical Devices (LD) in W83627HG. CR07h contains the Logical Device Number that can be changed to access the LD as needed. LD7 contains the GPIO10~17 registers.

Programming Guide:

Step1: CR2C_Bit [7..5]. P [1,1,1]; to select multiplexed pins as GPIO32~34 pins

Step2: LD7_CR07h.P [09h]; Point to LD9

Step3: LD7_CR30h_Bit1.P1; Enable GPIO3

Step4: Select GPIO direction, Get Status or output value.

LD9_CRF0h; GPIO37~30 direction, 1 = input, 0 = output pin

LD9_CRF2h.P [00h]; Let CRF1 (GPIO data port) non-invert to prevent from confusion

LD9_CRF1h; GPIO37~30 data port, for input pin, get status from the related bit, for output pin, write value to the related bit.

For example,

LD9_CRF0h_Bit4.P0; Let GPIO34 as output pin

LD9_CRF2h_Bit4.P0; Let CRF1_Bit4 non-inverted

LD9_CRF1h_Bit4.P0; Output "0" to GPIO34 pin (J13_Pin1)

LD9_CRF0h_Bit0.P1; Let GPIO30 as input pin

LD9_CRF2h_Bit0.P0; Let CRF1_Bit0 non-inverted

Read LD9_CRF1h_Bit0; Read the status from GPIO30 pin (J13_Pin2)

How to access W83627DHG CR?

In ROBO-8719VG2AR, the EFER = 002Eh, and EFDR = 002Fh.

EFER and EFDR are 2 IO ports needed to access W83627HG CR.

EFER is the Index Port, EFDR is the Data Port.

CR index number needs to be written into EFER first,

Then the data will be read/written from/to EFDR.

To R/W W83627HG CR, it is needed to Enter/Enable Configuration Mode first.

When completing the programming, it is suggested to Exit/Disable Configuration Mode.

Enter Configuration Mode: Write 87h to IO port EFER twice.

Exit Configuration Mode: Write AAh to IO port EFER.

3.6.3 Example

```
void enter_Superio2_CFG(void)
{
    outportb(0x2E, 0x87);
    outportb(0x2E, 0x87);
}

void exit_Superio2_CFG(void)
{
    outportb(0x2E, 0xAA);
}

void Set_CFG2(unsigned char Addr2,unsigned char Value2)
{
    unsigned char d2;
    outportb(0x2E, Addr2);
    delay(2);
    outportb(0x2E +1, Value2);
    delay(2);
}

unsigned char Get_CFG2(unsigned char Addr2)
{
    unsigned char d2;
    outportb(0x2E, Addr2);
    delay(2);
    d2 = inportb(0x2E +1);
    delay(2);
    return(d2);
}

int main(void)
{
    unsigned char d2;

    enter_Superio2_CFG();
    /* CR2A B7 = 1 selet GPIO Port 1*/
    d2 = Get_CFG2(0x2A);
    d2 = (d2 & 0x7F) | 0x80;
    Set_CFG2(0x2A, d2);
}
```

```
/* IO test loop 1 */
/* Set GPIO Port 1 of Superio 2 Enable */

Set_CFG2(0x07, 0x07);    /* Select logic device 07 of Superio2*/
Set_CFG2(0x30, 0x01);    /* Enable GPIO Port 1 of Superio2*/


/* IO test loop 1 */

/* Set GPIO Port 1 of Superio2 Enable */
Set_CFG2(0x07, 0x07);    /* Select logic device 07*/
Set_CFG2(0xF0, 0x0F);    /* GPIO Port 1 of Superio2 is [ooooiiii], o:output,
                          i:input */
Set_CFG2(0xF2, 0x00);    /* GPIO Port 1 of Superio2 is non-inversed*/
Set_CFG2(0x07, 0x07);    /* Select logic device 07*/
Set_CFG2(0xF1, 0xFF);    /* Initial back all GPIO Port1 of Superio 2 to hi */


Set_CFG2(0x07, 0x07);    /* Select logic device 07*/
Set_CFG2(0xF1, 0xEF);    /* GP14 of Superio2 -> ~GP10 of Superio2 */
Set_CFG2(0x07, 0x07);    /* Select logic device 07 of Superio2*/
d2 = Get_CFG2(0xF1);     /* get GPIO Port 2 data */

if (d2 == 0xEE )

    printf("\n GPIO14->10 test ok");
else
    printf("\n GPIO14->10 test fail ");
```

Chapter 4

BIOS Setup Information

ROBO-8719VG2AR is equipped with the AMI BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, ROBO-8719VG2AR communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

4.1 Entering Setup -- Launch System Setup

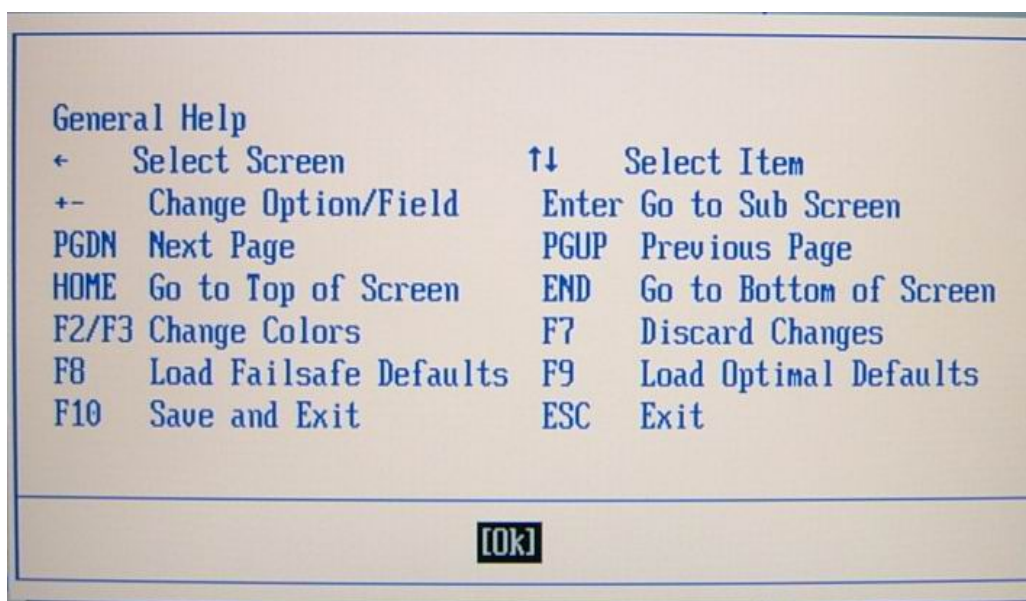
Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Del> key to enter Setup.

Press <Del> to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

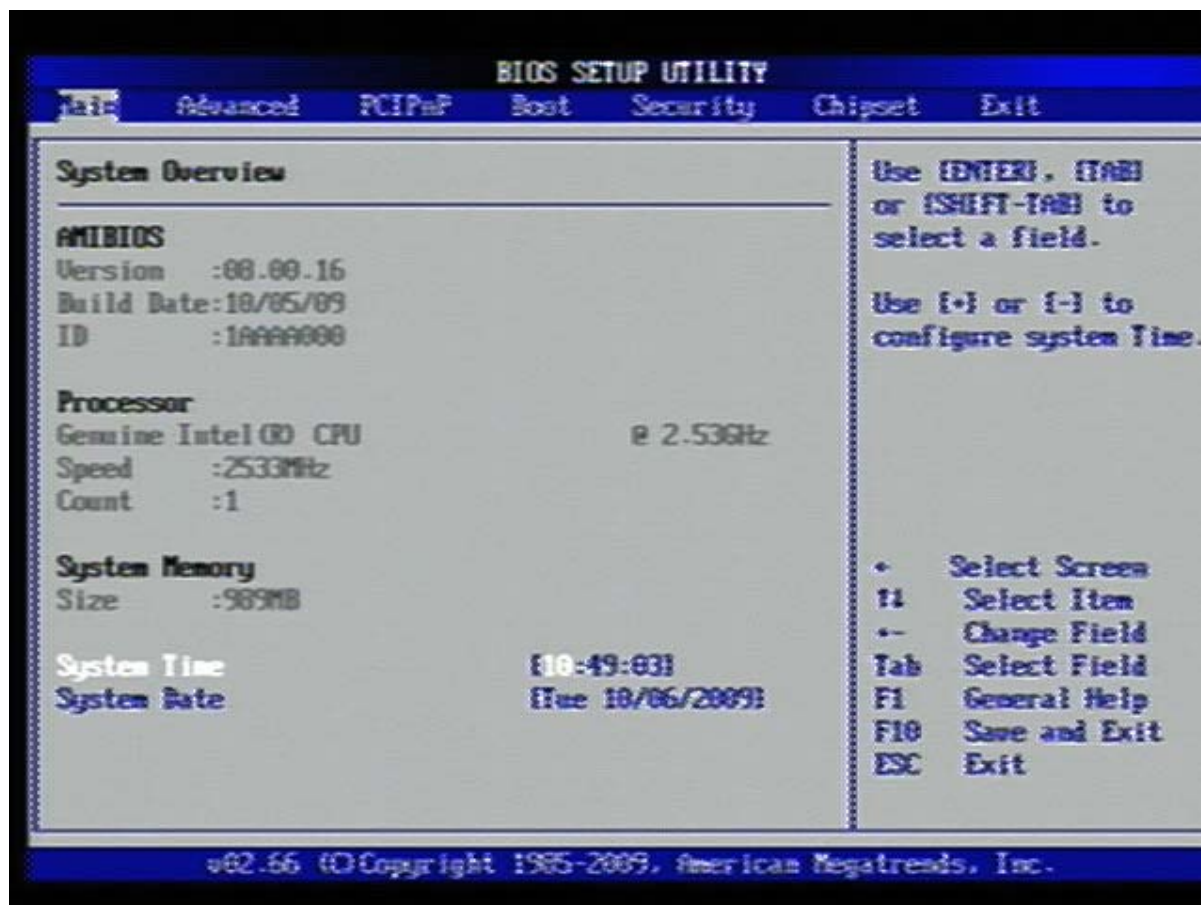
Press <F1> to Run SETUP or Resume

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.



4.2 Main

Use this menu for basic system configurations, such as time, date etc.



AMI BIOS, Processor, System Memory

These items show the firmware and hardware specifications of your system. Read only.

System Time

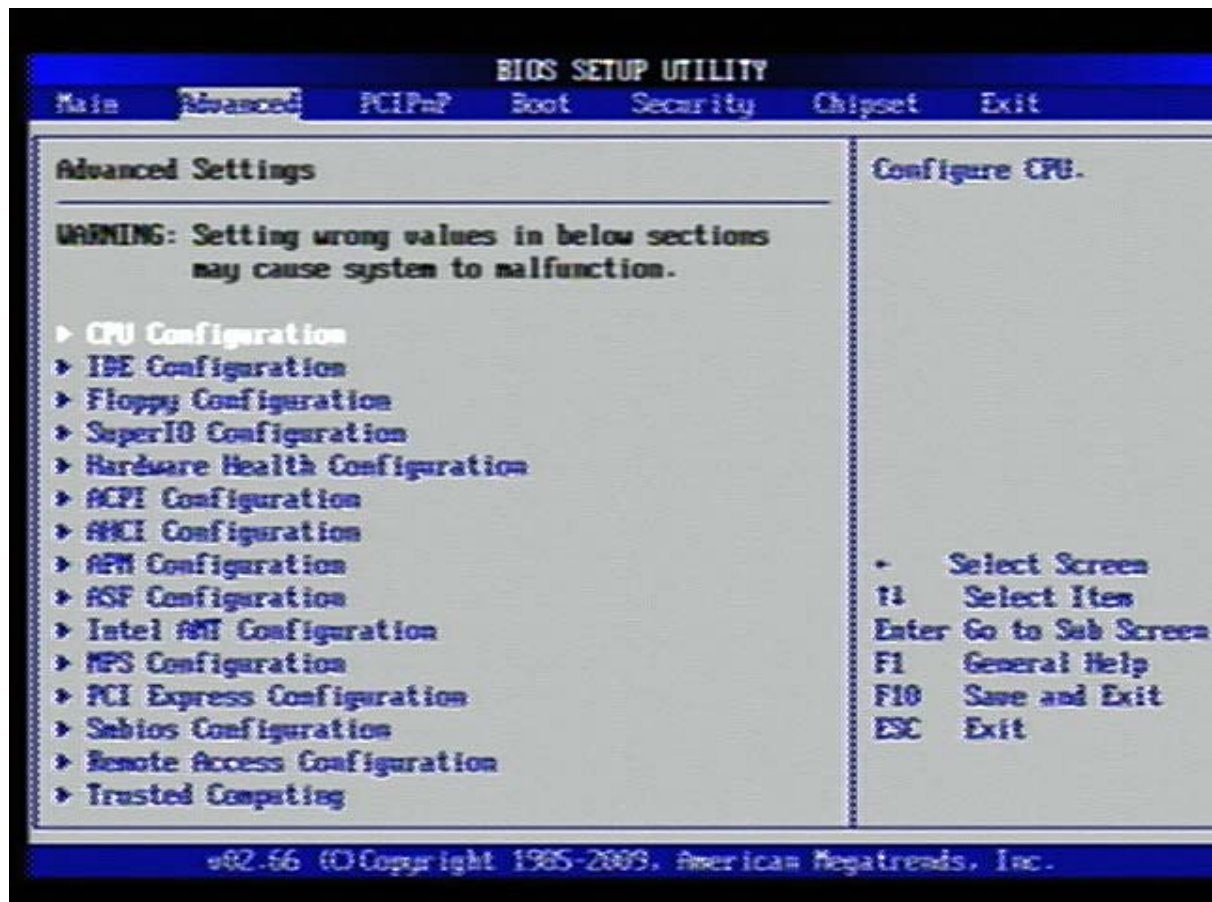
The time format is <Hour> <Minute> <Second>. Use [+] or [-] to configure system Time.

System Date

The date format is <Day>, <Month> <Date> <Year>. Use [+] or [-] to configure system Date.

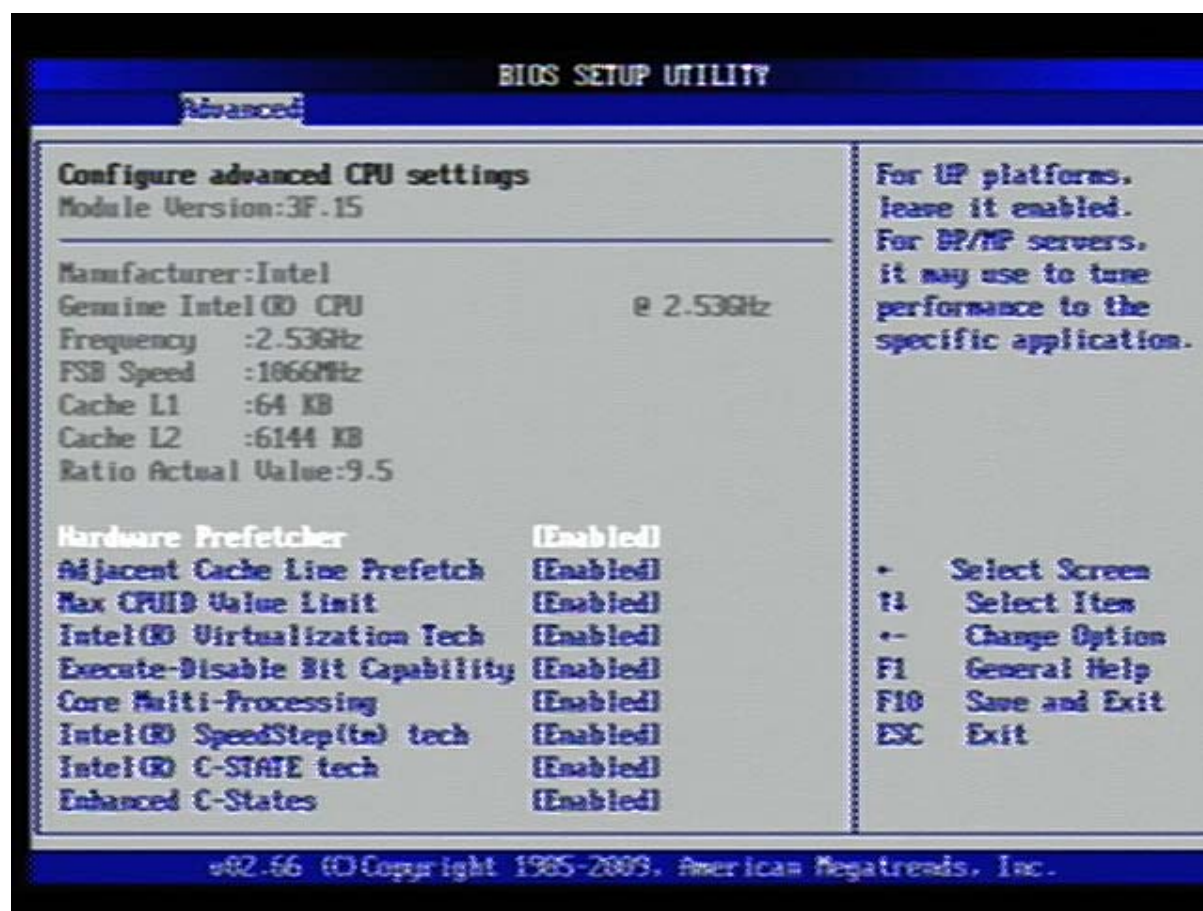
4.3 Advanced

Use this menu to set up the items of special enhanced features.



CPU Configuration

These items show the advanced specifications of your CPU. Read only.



Execute-Disable Bit Capability

Disabled force the XD feature flag to always return 0.

The choice: Disabled, Enabled.

PECI

When enabled, enables PECI interface.

The choice: Disabled, Enabled.

Core Multi-Processing

Disabled disable one execution core of each CPU die.

The choice: Disabled, Enabled.

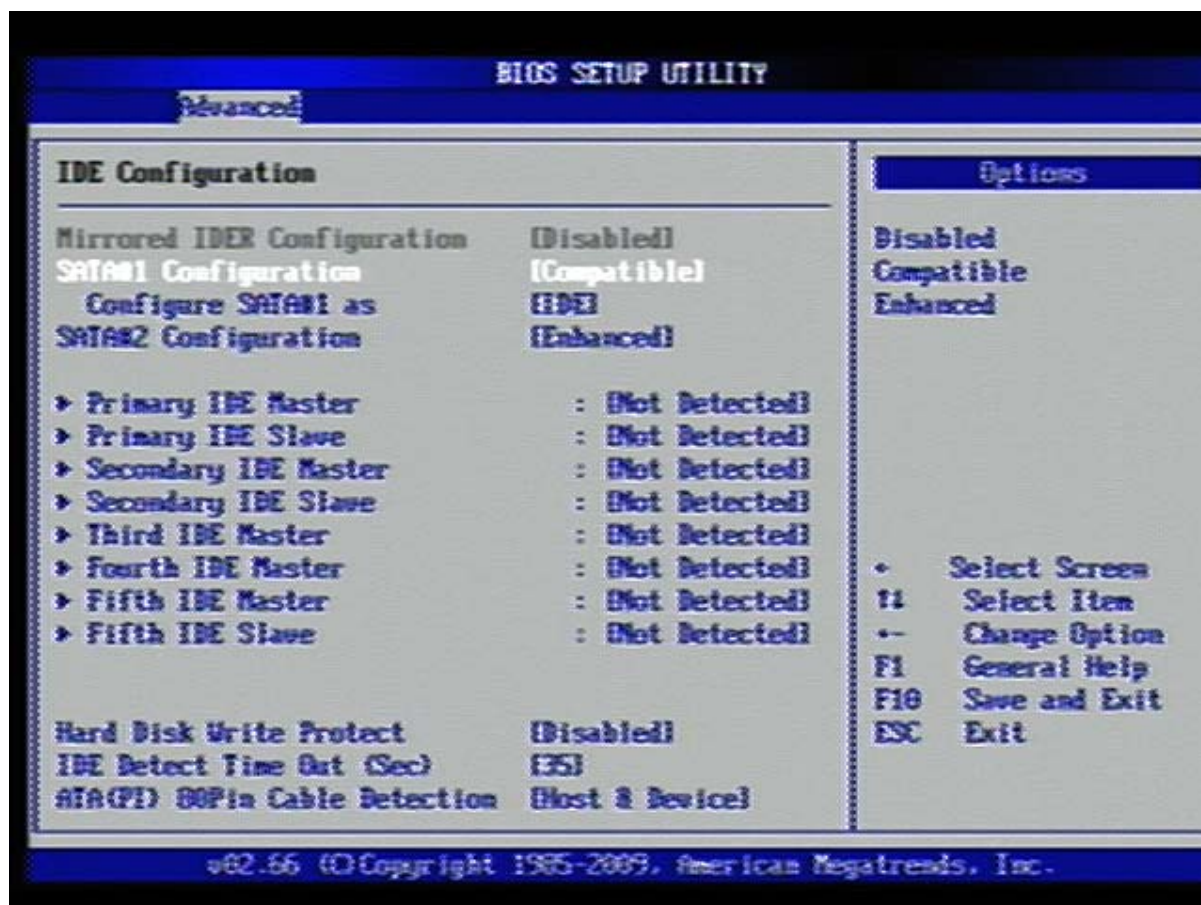
Intel® (R) SpeedStep (tm) tech

Disabled / Enabled GV3 tech function.

The choice: Disabled, Enabled.

IDE Configuration

The IDE Configuration the IDE devices, such as hard disk drive or CD-ROM drive. It uses a separate sub menu to configure each hard disk drive (Master and Slave).

**SATA#1 Configuration**

The choice: Disabled, Compatible, Enabled.

Configure SATA#1 as

This setting specifies the function of the on-chip SATA#1 controller.

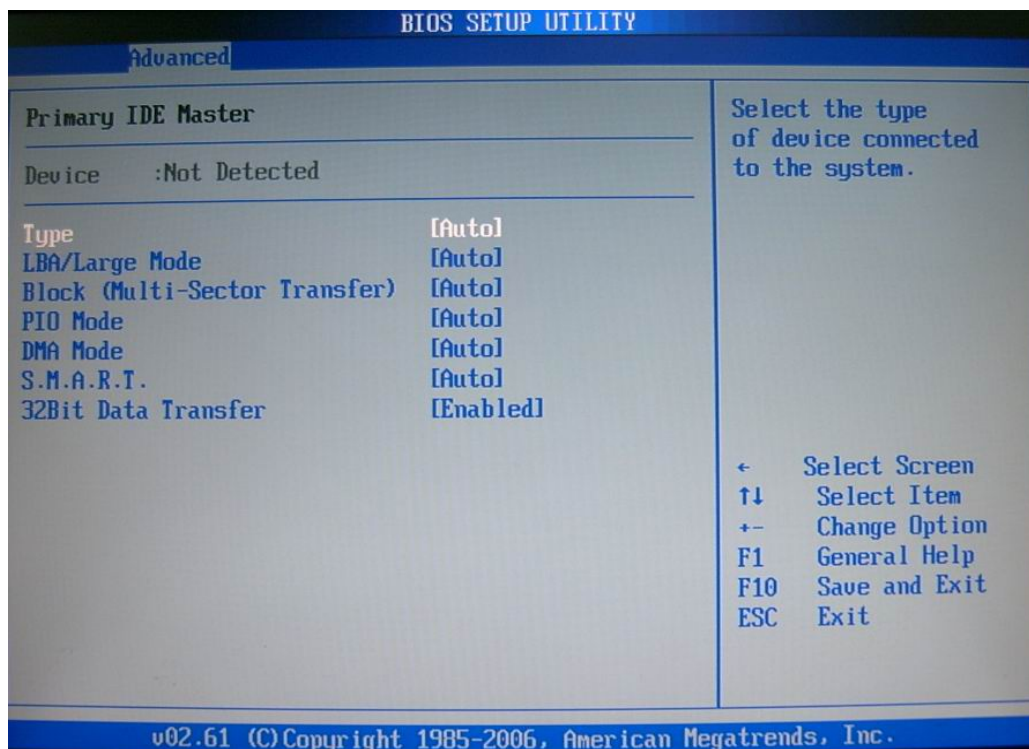
The choice: IDE, RAID, AHCI.

SATA#2 Configuration

The choice: Disabled, Enabled.

Primary / Secondary / Third / Fourth IDE Master / Slave

While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.



[Type] Press PgUp/<+> or PgDn/<−> to select [Manual], [None] or [Auto] type. you can use [Manual] to define your own drive type manually.

[LBA/Large Mode] Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors.

[Block (Multi-Sector Transfer)] Any selection except Disabled determines the number of sectors transferred per block.

[PIO Mode] Indicates the type of PIO (Programmed Input/Output)

[DMA Mode] Indicates the type of Ultra DMA

[S.M.A.R.T.] This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S. M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.

[32 Bit Data Transfer] Enable/Disable 32-bit Data Transfer.

Hard Disk Write Protect

Disabled/Enabled device write protection, this will be effective only if device is accessed through BIOS.

The choice: Disabled, Enabled.

IDE Detect Time Out (Sec)

Select the time out value for detecting ATA/ ATAPI device (s).

The choice: 0, 5, 10, 15, 20, 25, 30, 35.

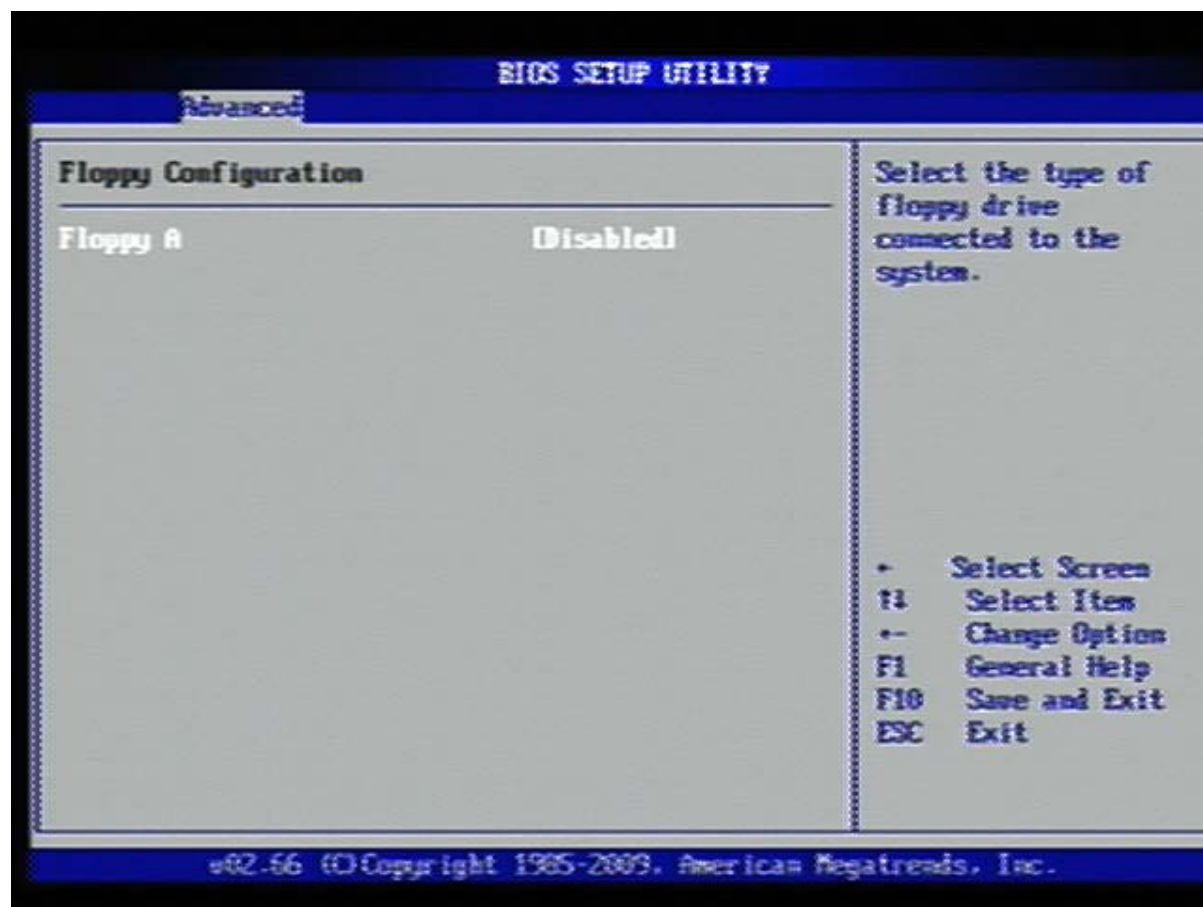
ATA (PI) 80Pin Cable Detection

Select the mechanism for detecting 80Pin ATA (PI) cable.

The choice: Host & Device, Host, Device.

Floppy Configuration

This Sub-Menu contains Setup Items which control configuration of the Internal Graphics Display Device.

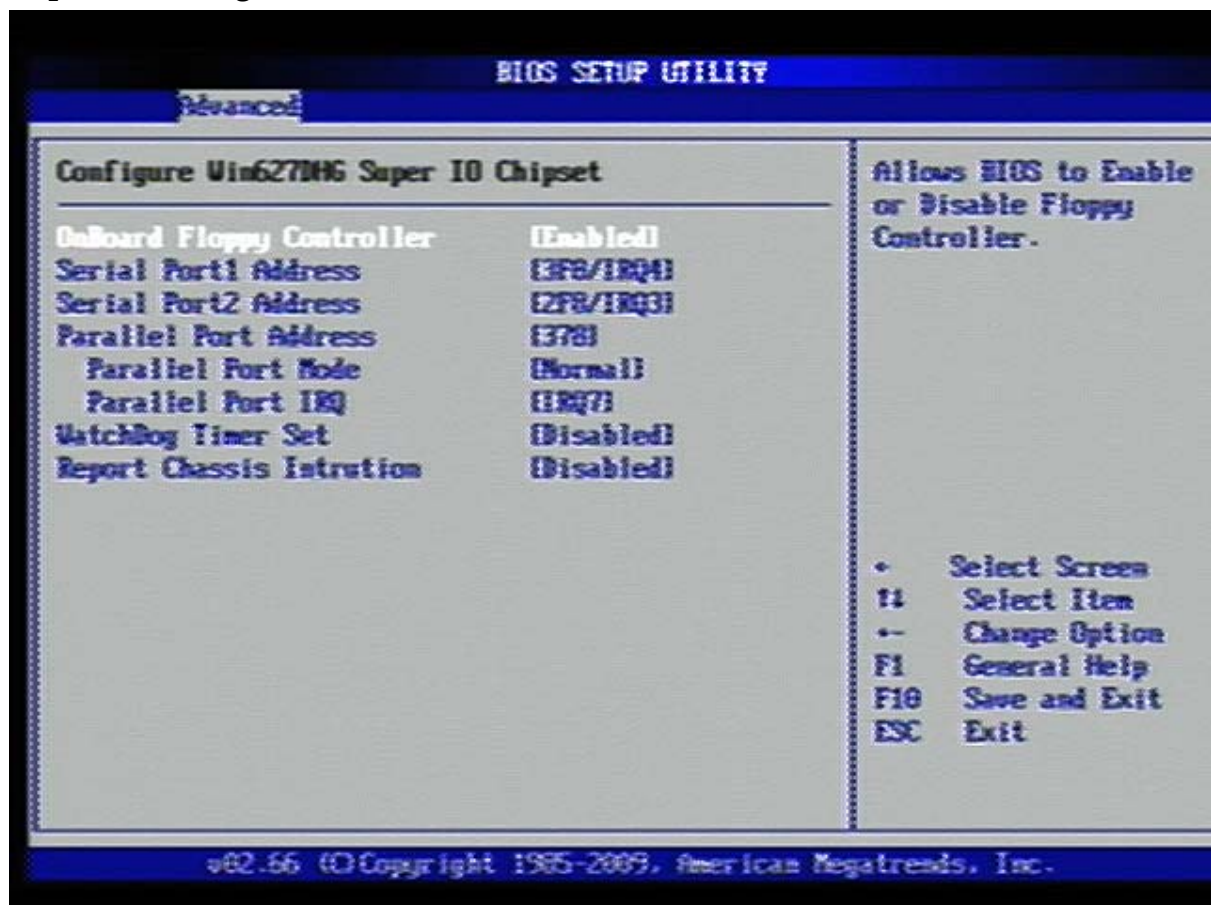


Floppy A

Select the type of floppy drive connected to the system.

The choice: None, 360KB 5 1/4", 1.2MB 5 1/4", 720KB 3 1/2", 1.44MB 3 1/2", 2.88MB 3 1/2".

Super IO Configuration



OnBoard Floppy Controller

This item allows enable/disable onboard Floppy disk controller.

The choice: Disabled, Enabled.

Floppy Drive Swap

If the system has two floppy drives, choose enable to assign physical driver B to logical drive A and Vice-Versa.

The choice: Disabled, Enabled.

Serial Port 1/Port 2 Address

Allows BIOS Select Serial Port1 or Port2 Base Addresses.

The choice: Disabled, 3F8/IRQ4, 3E8/IRQ4, 2E8/IRQ3.

Serial Port 2 Mode

This item allows users to select Infrared transmission mode.

The choice: Normal, IrDA, ASK IR.

Onboard CIR Port

Allows BIOS select Enable or Disable CIR Port.

The choice: Disabled, 3E0, 2E0.

Parallel Port Address

This item allows you to configuring I/O of the onboard parallel port.

The choice: Disabled, 378, 278, 3BC.

Parallel Port Mode

There are five different modes for the onboard parallel port:

Normal	Switch to Normal mode
Bi-Directional	Switch to Bi-Directional mode
ECP	Switch to ECP mode
EPP	Switch to EPP mode
ECP & EPP	Switch to ECP & EPP mode

Parallel Port IRQ

Allows BIOS Select Parallel Port IRQ.

The choice: IRQ5, IRQ7.

Watch Dog Timer

This BIOS testing option is able to reset the system according to the selected table.

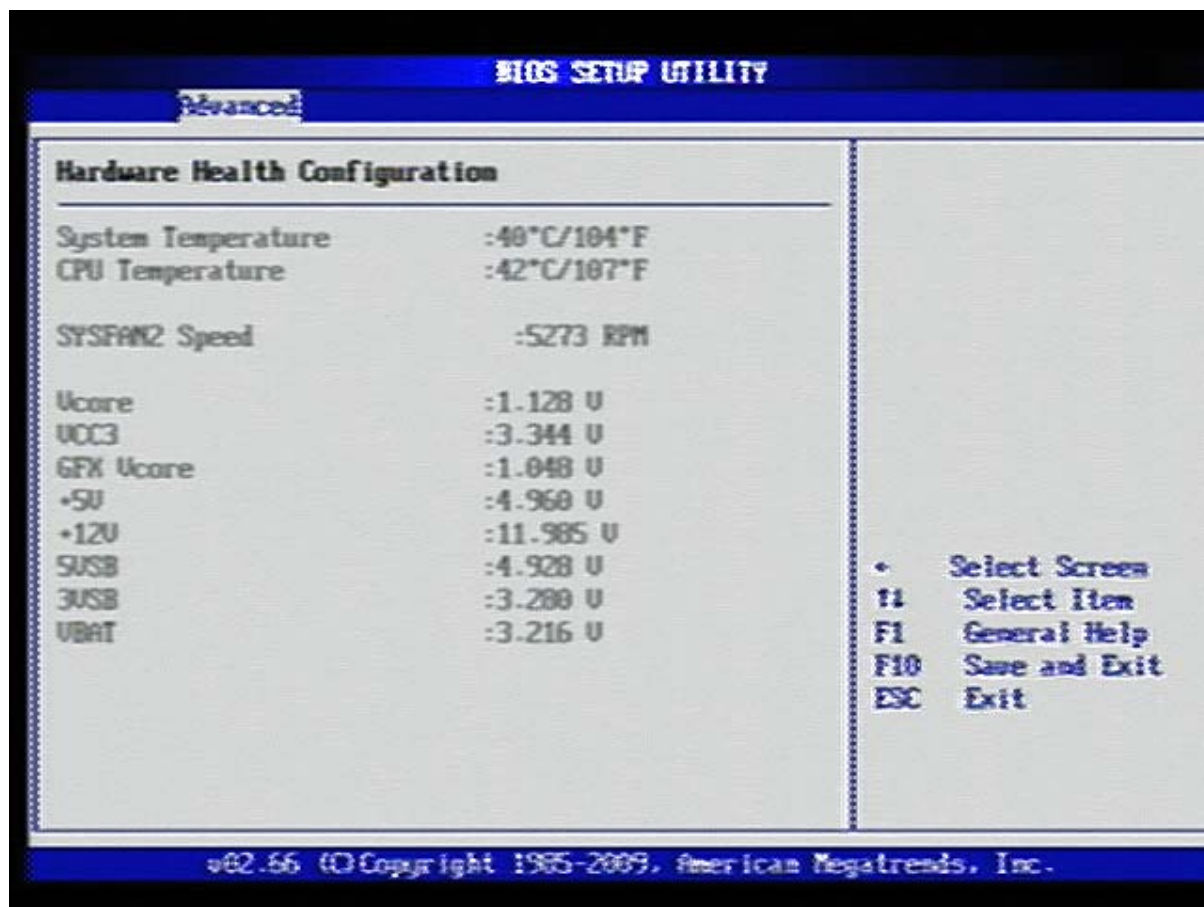
The choice: Disabled, 30, 60, 90, 120, 150, 180, 210 sec.

Report Chassis Intrusion

The choice: Disabled, Enabled.

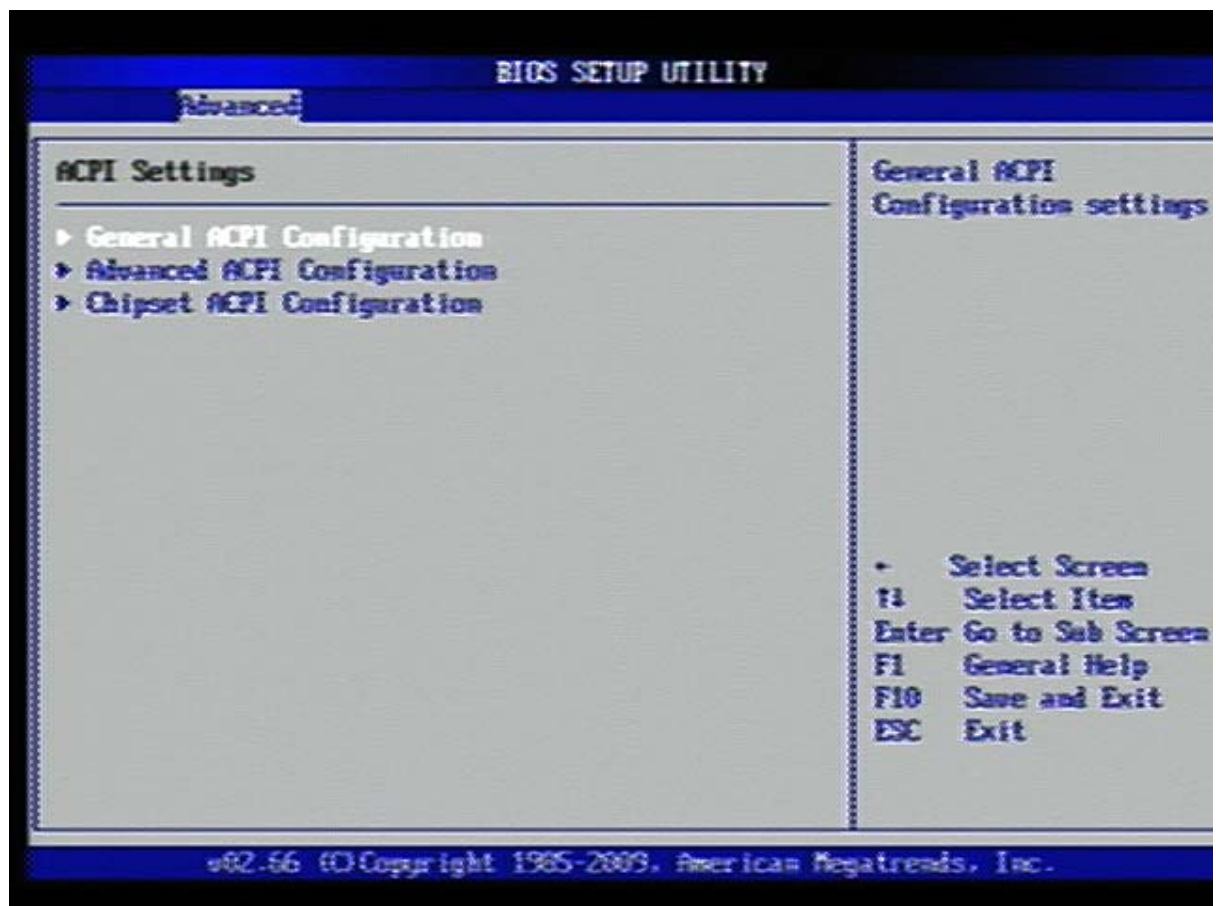
Hardware Health Configuration

Configuration / monitor the Hardware Health.

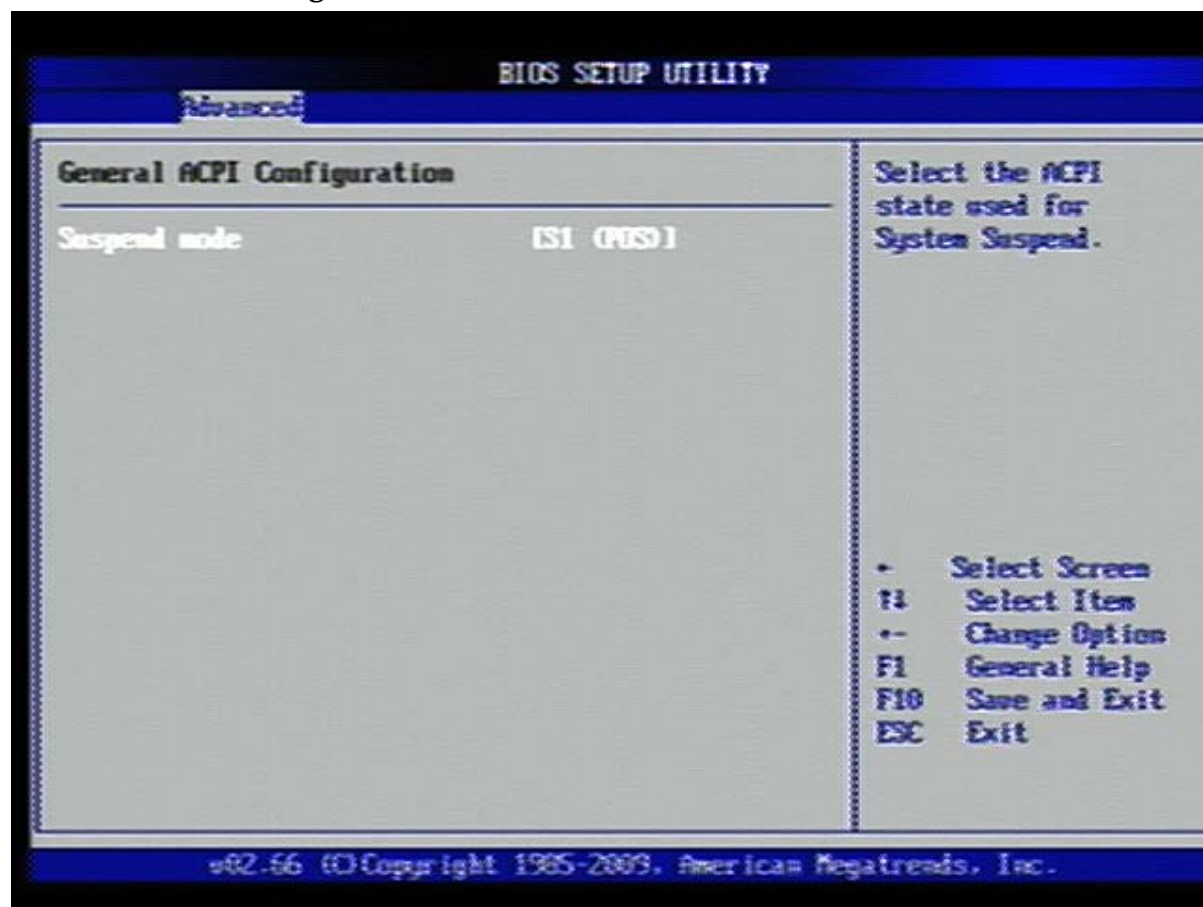


ACPI Configuration

Select for Advanced ACPI Configuration.



General ACPI Configuration



Suspend mode

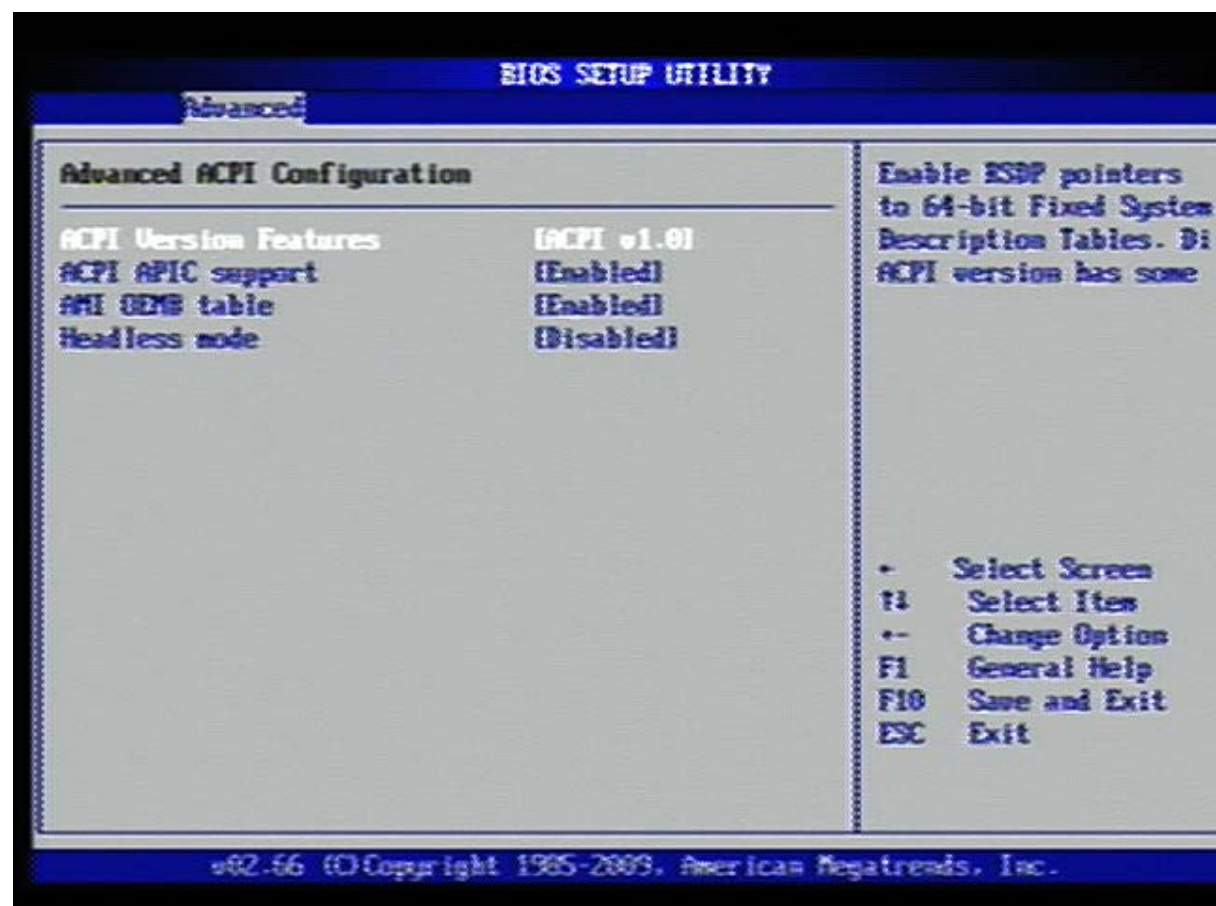
This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field. Options are:

[S1 (POS)] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system contexts.

[S3 (STR)] The S3 sleep mode is a lower power state where the information of system configuration and open applications/ files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a "wake up" event occurs.

Advanced ACPI Configuration

Advanced ACPI Configuration settings, Use this section to configure additional ACPI options.



ACPI Version Features

Enable RSDP pointers to 64-bit Fixed System Description Tables.

The choice: ACPI v1.0 / ACPI v2.0 / ACPI v3.0.

ACPI APIC support

Include ACPI APIC table pointer to RSDT pointer list.

The choice: Disabled, Enabled.

AMI OEMB table

Include OEMB table pointer to R(X) SDT pointer list.

The choice: Disabled, Enabled.

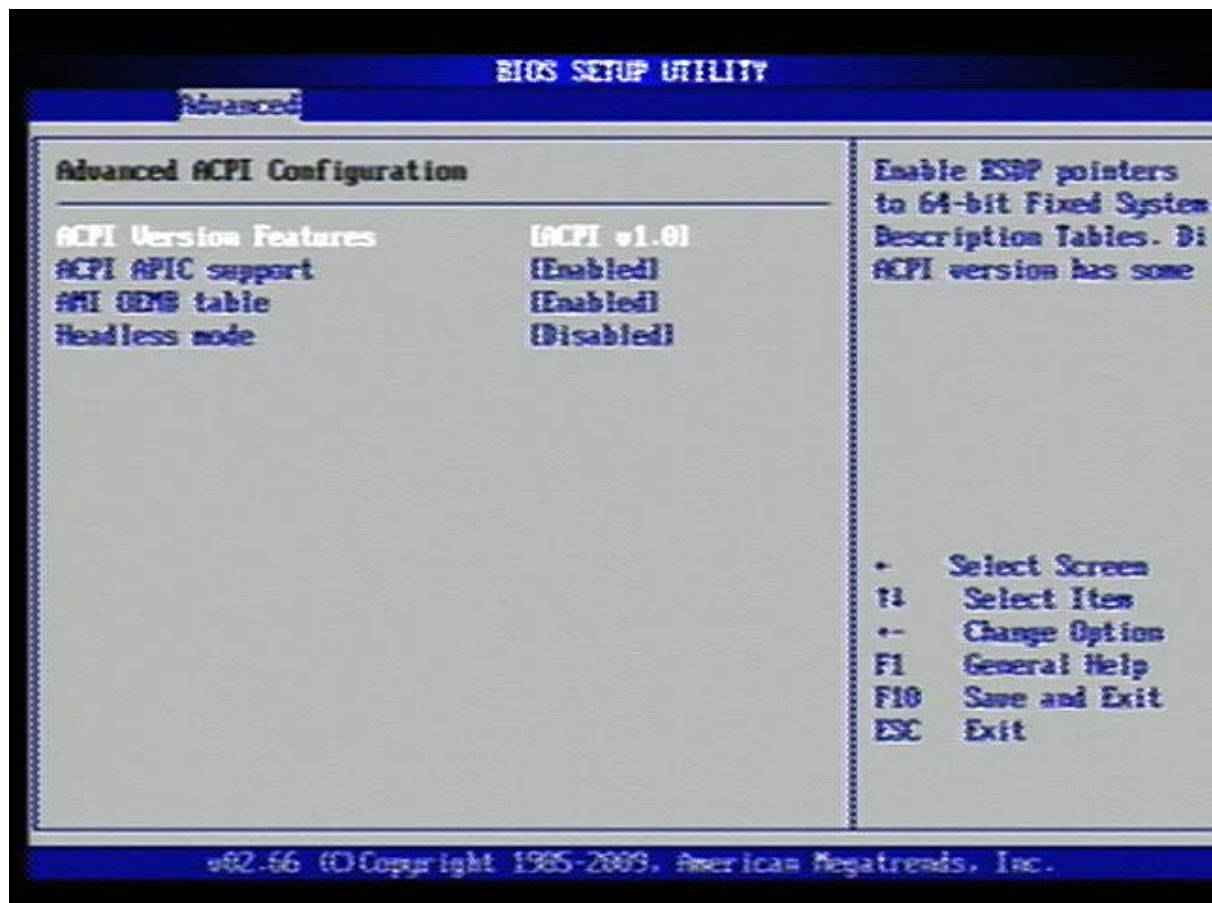
Headless mode

Enable / Disable Headless operation mode through ACPI.

The choice: Disabled, Enabled.

Chipset ACPI Configuration

Chipset ACPI related Configuration settings, Use this section to configure additional ACPI options.



Energy Lake Feature

Select the ACPI state used for System Suspend.

The choice: Disabled, Enabled.

APIC ACPI SCI IRQ

Enable / Disable APIC ACPI SCI IRQ.

The choice: Disabled, Enabled.

USB Device Wake From S3/S4

Enable / Disable USB device Wake from S3/S4 mode.

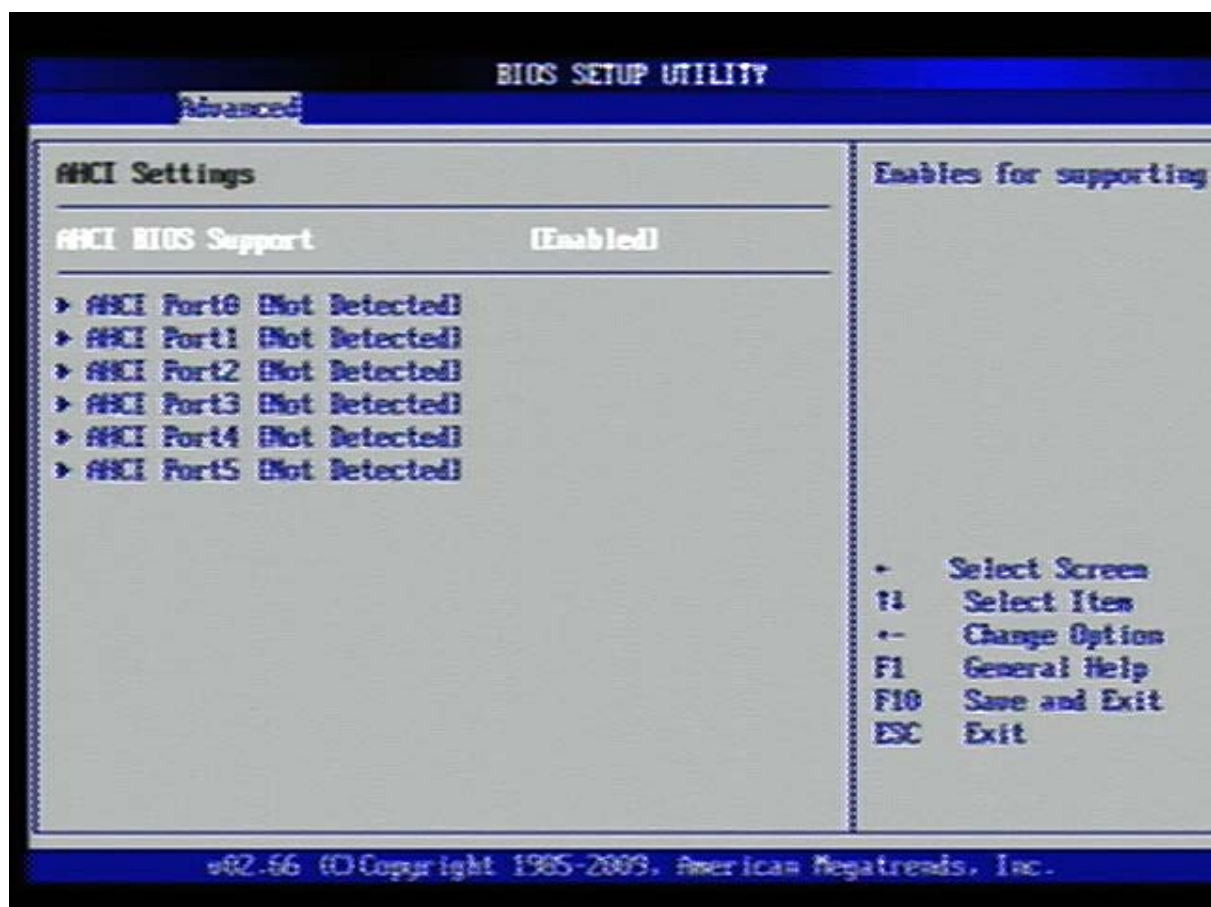
The choice: Disabled, Enabled.

High Performance Event Time

The choice: Disabled, Enabled.

AHCI Configuration

Select for AHCI Configuration.

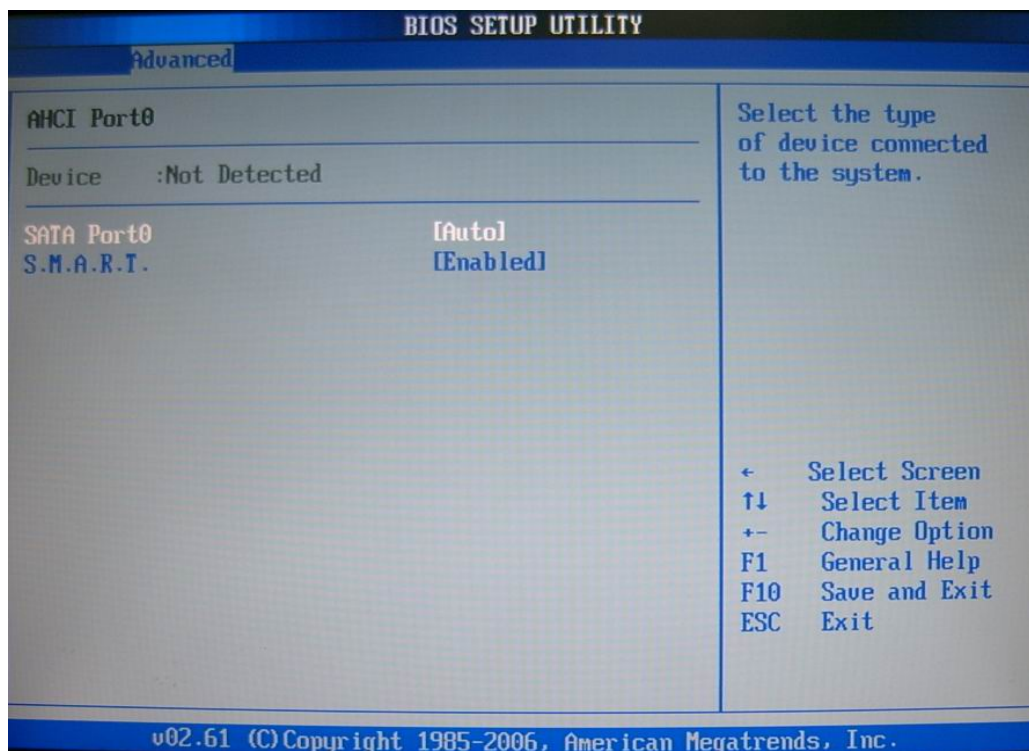
**AHCI CD/DVD Boot Time out**

Some SATA CD/DVD in AHCI mode need to wait ready longer.

The choice: 0, 5, 10, 15, 20, 25, 30, 35.

AHCI Port0 ~ Port5

While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.



SATA Port0 ~ Port5

Select the type of device connected to the system.

The choice: Auto, Not Installed.

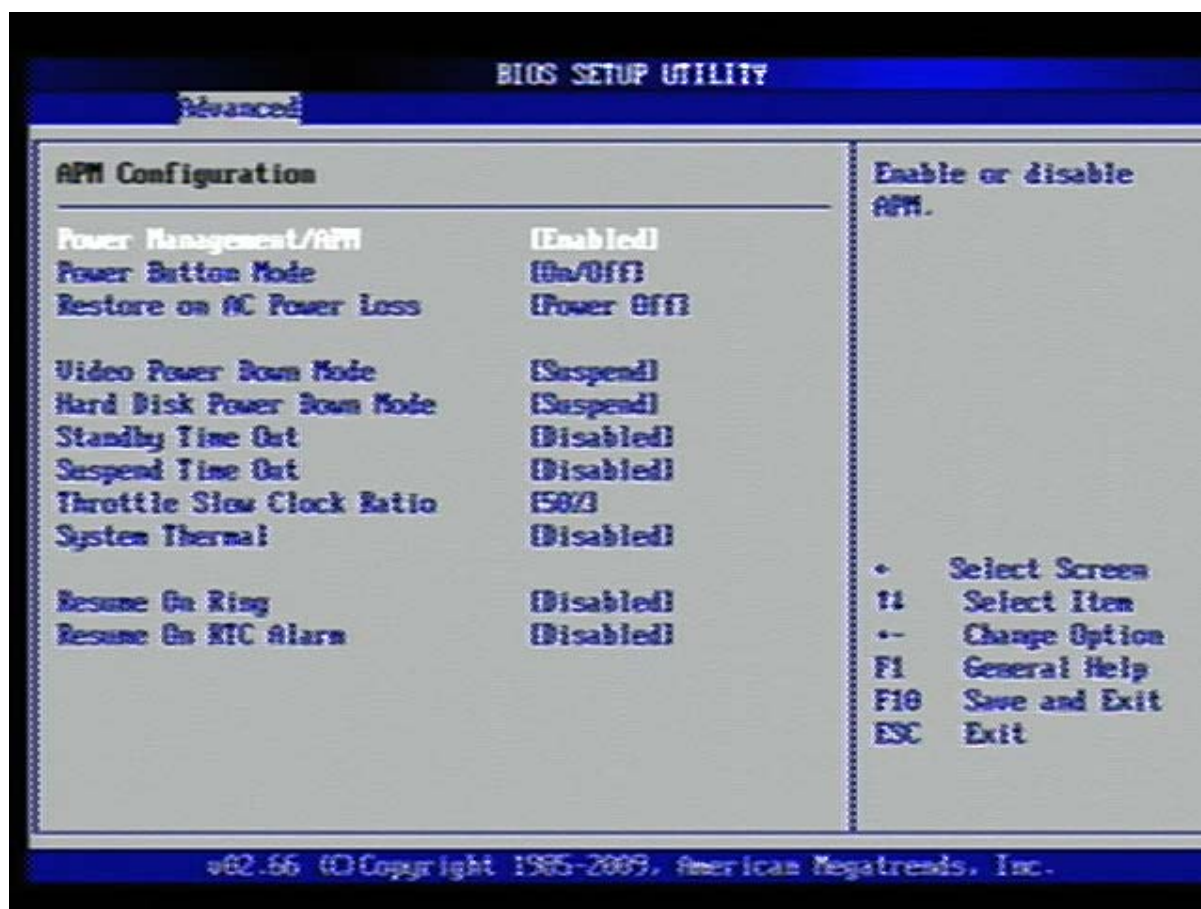
S.M.A.R.T

This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S. M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.

The choice: Disabled, Enabled.

APM Configuration

Select for APM Configuration.



Power Management/APM

Enabled or Disable APM Mode.

The choice: Disabled, Enabled.

Video Power Down Mode

Select Power Down video in Suspend or Standby Mode.

The choice: Disabled, Suspend.

Hard Disk Power Down Mode

Select Power Down Hard Disk in Suspend or Standby Mode.

The choice: Disabled, Enabled.

Suspend Time Out

Go into Suspend in the specified Time.

The choice: Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 10 Min, 20 Min, 30 Min, 40 Min, 50 Min, and 60 Min.

Throttle Slow Clock Ratio

Select the Duty Cycle in Throttle mode.

The choice: 87.5%, 75.0%, 62.5%, 50%, 37.5%, 25%, 12.5%.

Keyboard & PS/2 Mouse

The choice: IGNORE, MONITOR.

Power Button Mode

Go into On/Off or Suspend when Power button is pressed.

The choice: On/Off, Suspend.

Resume On Ring

Disable/Enable RI to generate a wake event.

The choice: Disabled, Enabled.

Resume On PCIE WAKE#

Disable/Enable GPI to generate a wake event.

The choice: Disabled, Enabled.

Resume On PCI PME#

Disable/Enable PME to generate a wake event.

The choice: Disabled, Enabled.

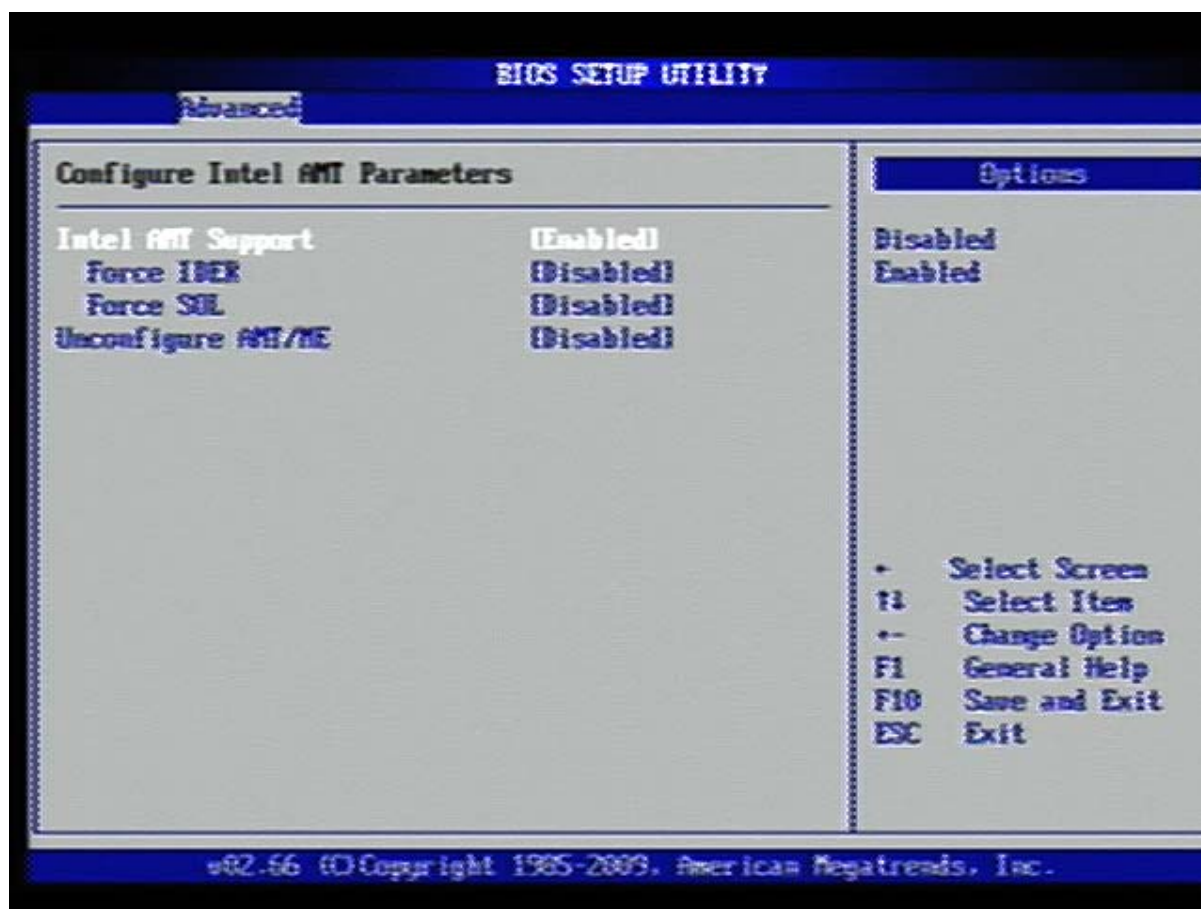
Resume On RTC Alarm

Disable/Enable RTC to generate a wake event.

The choice: Disabled, Enabled.

Intel® AMT Configuration

Select for Intel® AMT Configuration.



Intel® AMT Support

Disable/Enable Intel® AMT function support.

The choice: Disabled, Enabled.

If you want to use AMT function, LAN cable must on 82567LM

Force IDER

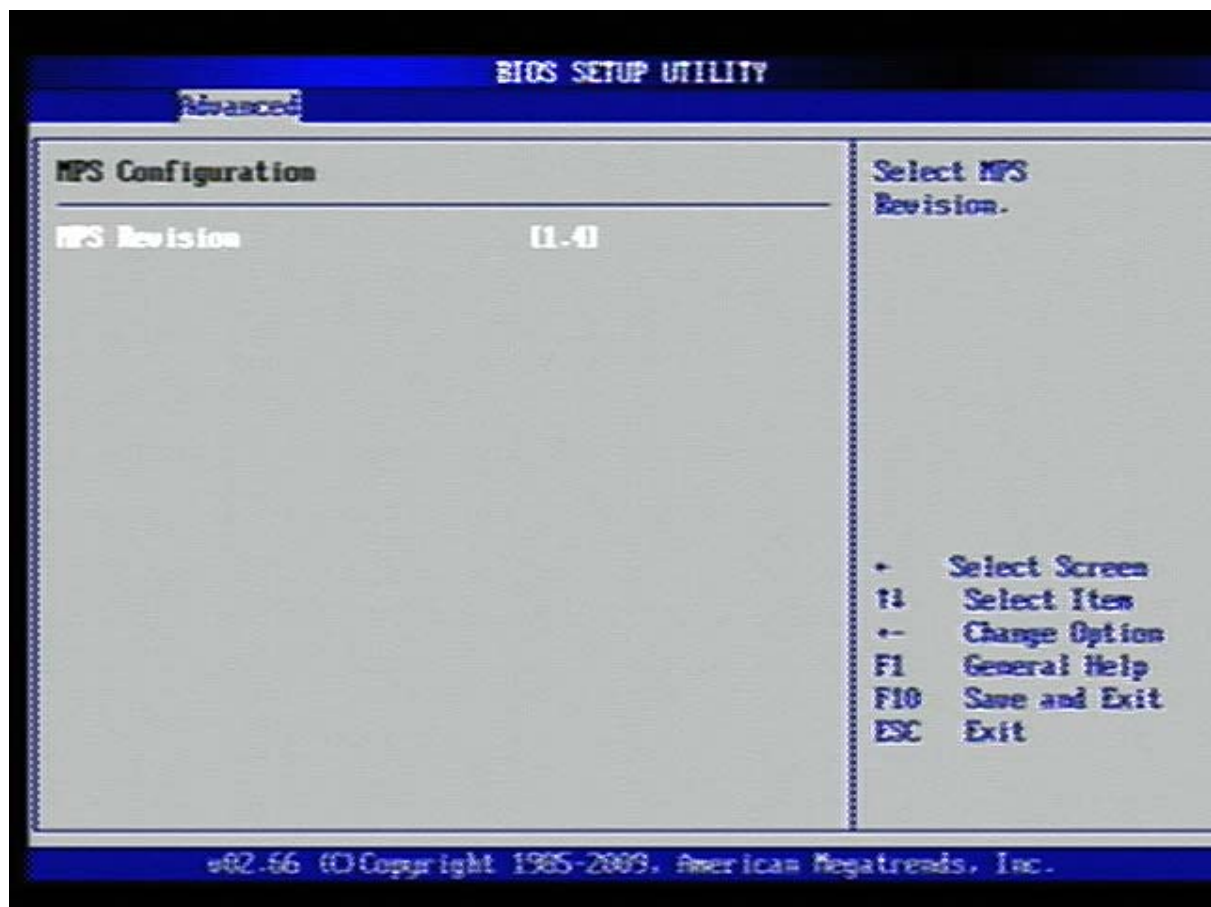
The choice: Disabled, IDER Pri. Master, IDER Pri. Slave, IDER Sec. Master, IDER Sec. Slave.

Force SOL

The choice: Disabled, Enabled.

MPS Configuration

Configure the Multi-Processor Table.



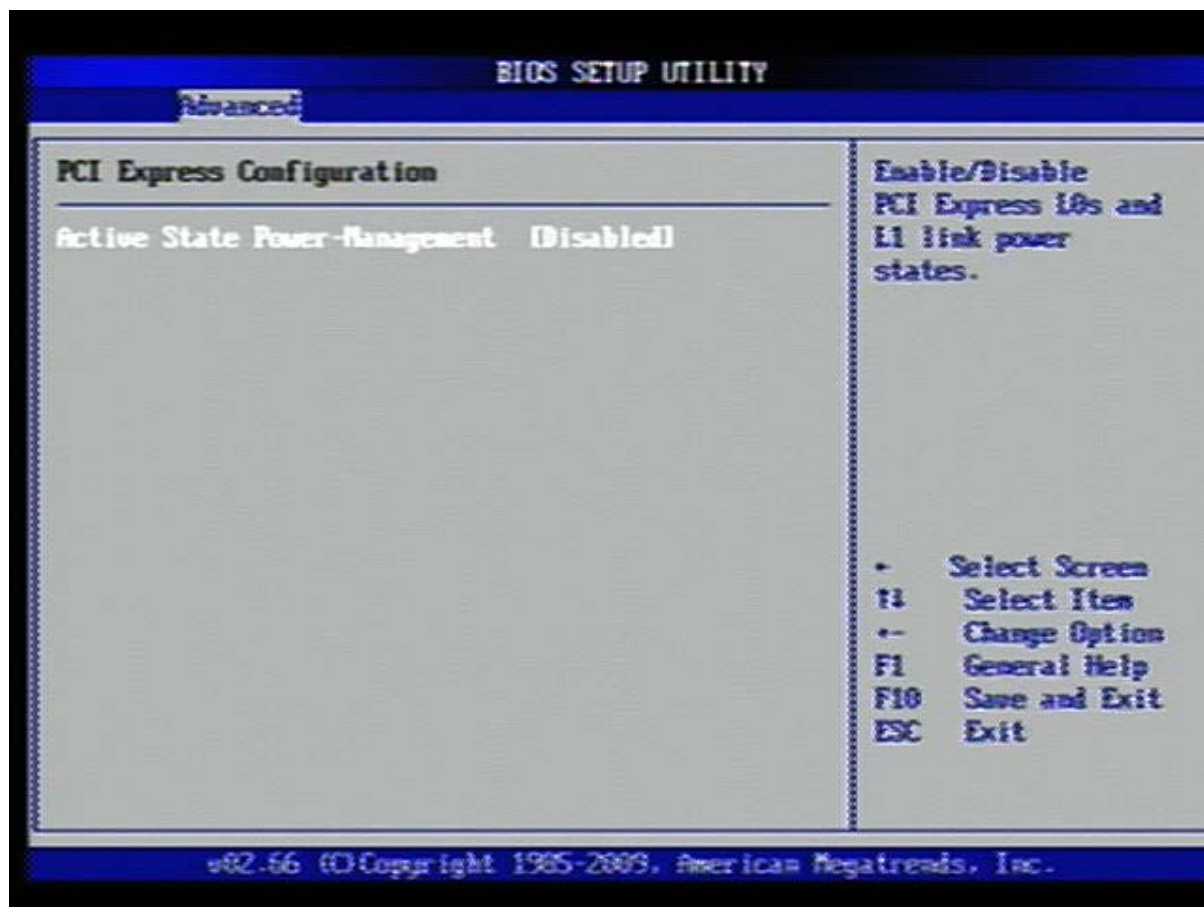
MPS Revision

This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system.

The choice: 1.1, 1.4.

PCI Express Configuration

Configure PCI Express Support.



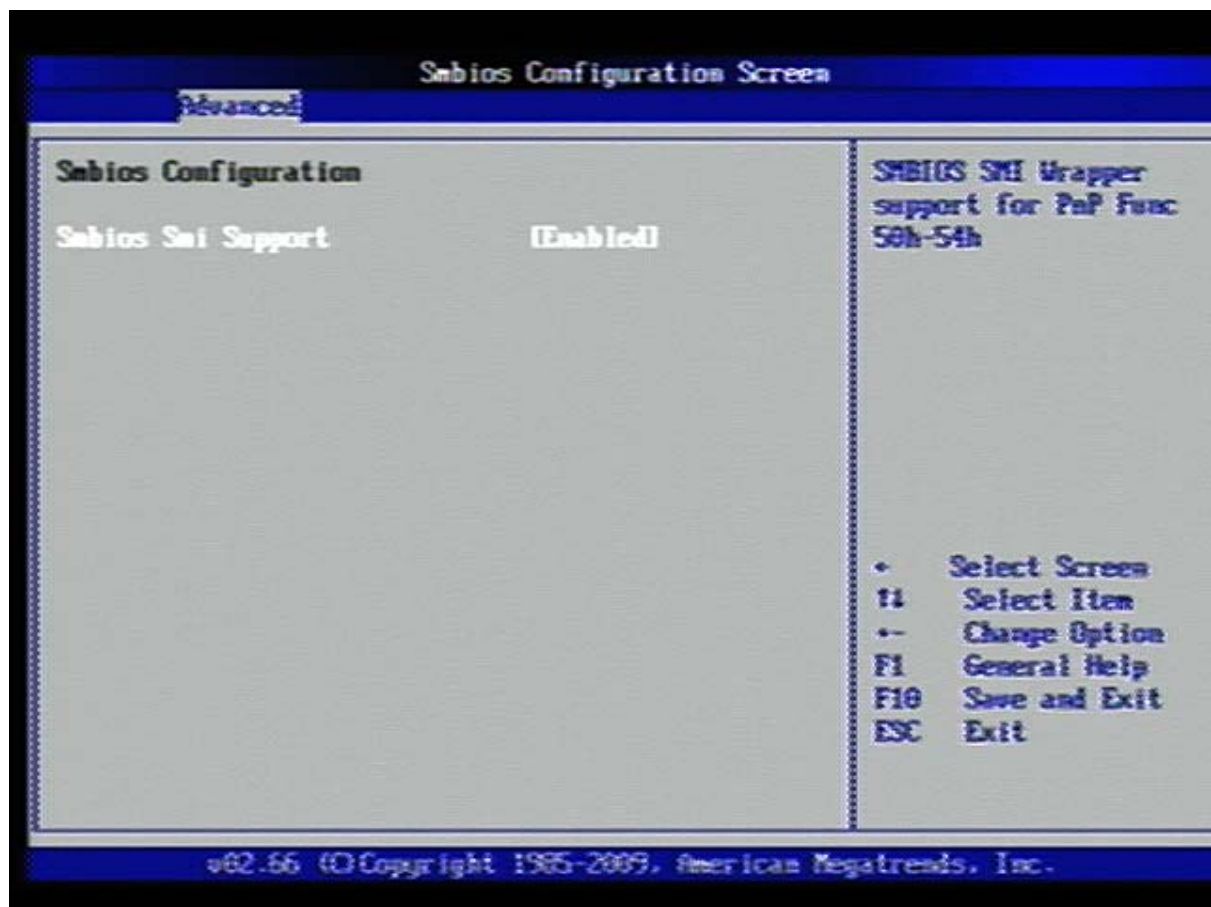
Active State Power-Management

PCI Express L0s and L1 link power states.

The choice: Disabled, Enabled.

Smbios Configuration

SMBIOS Configuration Menu.

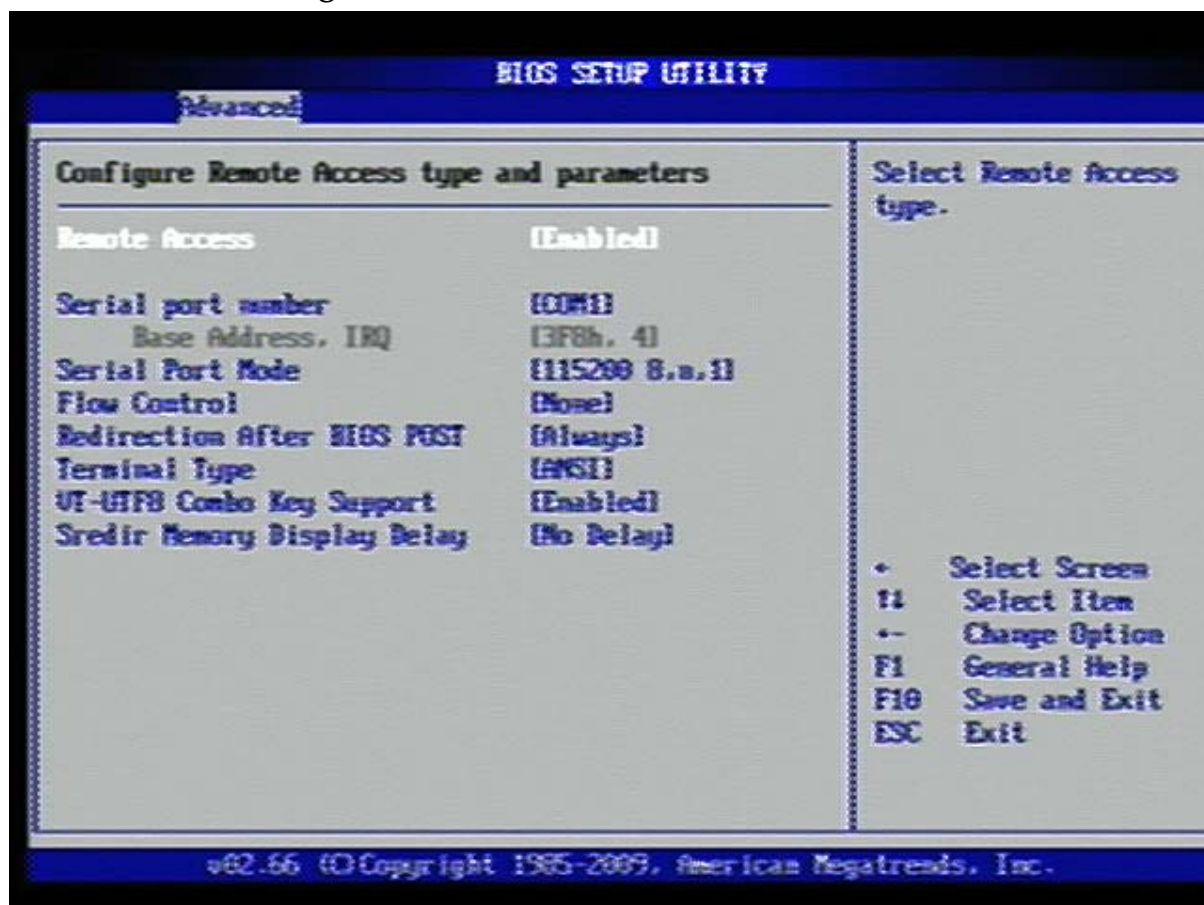


Smbios Smi Support

SMBIOS SMI Wrapper support for PnP Func 50h-54h.

The choice: Disabled, Enabled.

Remote Access Configuration

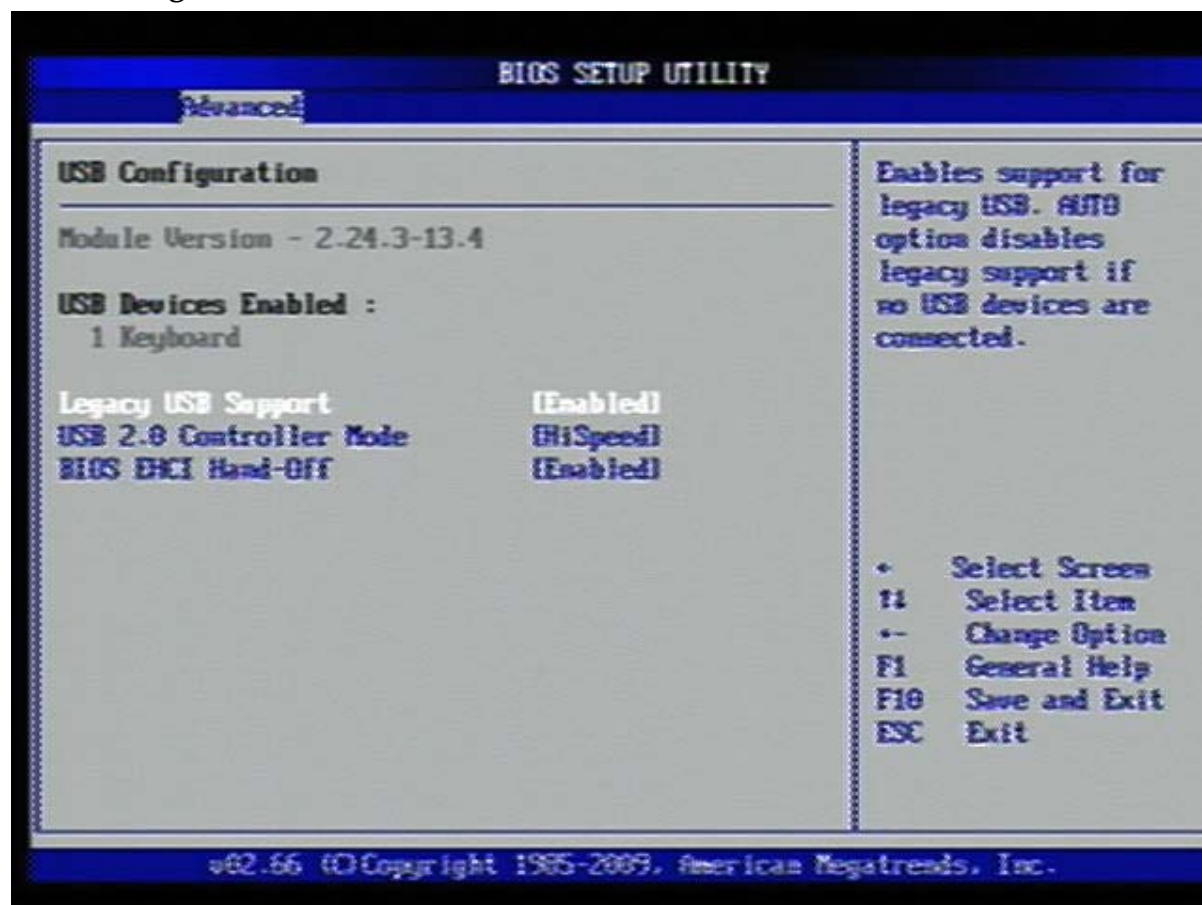


Remote Access

Select Remote Access type.

The choice: Disabled, Enabled.

USB Configuration



Legacy USB Support

Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.

The choice: Disabled, Enabled, Auto.

USB 2.0 Controller Mode

This setting specifies the operation mode of the onboard USB 2.0 controller.

The choice: FullSpeed, HiSpeed.

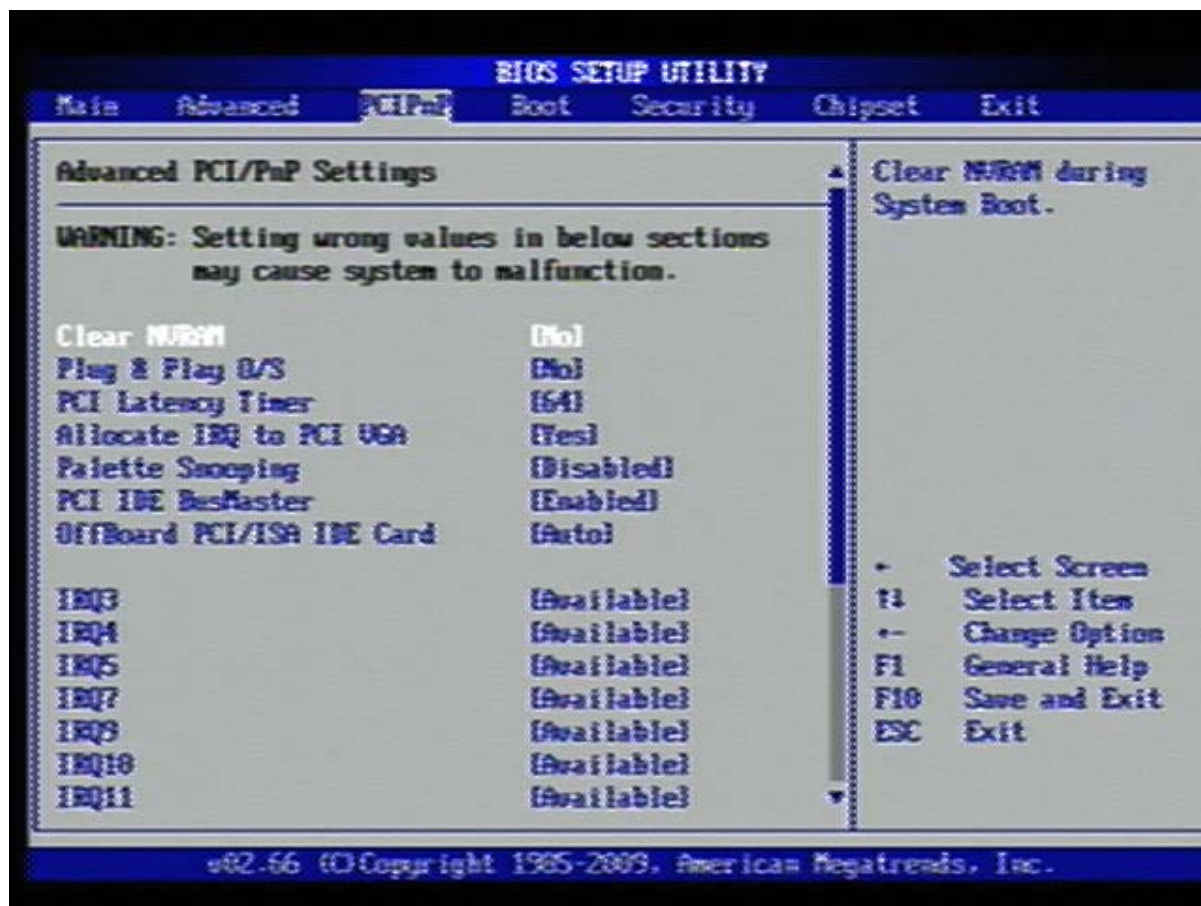
BIOS EHCI Hand-Off

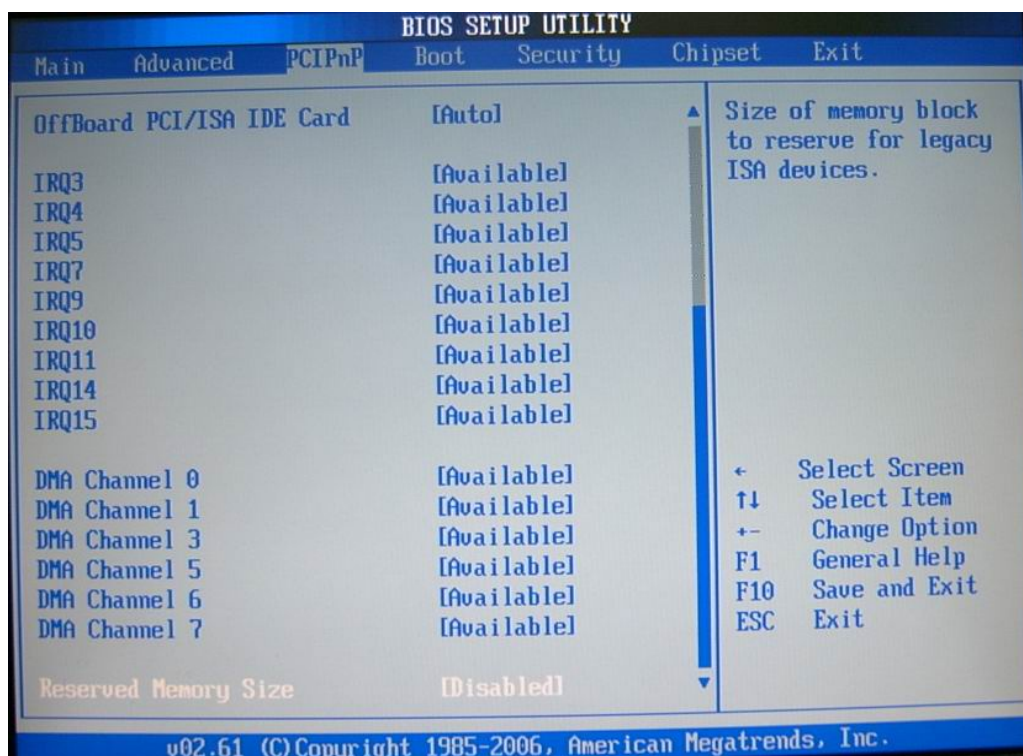
This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.

The choice: Disabled, Enabled.

4.4 PCIPnP

Advanced PCI/PnP setting wrong values in below sections may cause system to malfunction.





Clear NVRAM

Clear NVRAM during System Boot.

The choice: No, Yes.

Plug & Play O/S

No: lets the BIOS configure all the devices in the system.

Yes: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.

The choice: No, Yes.

PCI Latency Timer

Select value in units of PCI clocks for PCI device latency timer register.

The choice: 32, 64, 96, 128, 160, 192, 224, 248.

Allocate IRQ to PCI VGA

Yes: Assigns IRQ to PCI VGA card if card requests an IRQ.

No: Does not assign IRQ to PCI VGA card even if card requests an IRQ.

The choice: No, Yes.

Palette Snooping

Enabled: informs the PCI devices that an ISA graphics device is installed in the system so the card will function correctly.

The choice: Disabled, Enabled.

PCI IDE BusMaster

Enabled: Uses PCI bus mastering for reading / writing to IDE drives.

The choice: Disabled, Enabled.

OffBoard PCI/ISA IDE Card

Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card. AUTO: Works for most PCI IDE cards

The choice: Auto, PCI Slot1, PCI Slot2, PCI Slot3, PCI Slot4, PCI Slot5, PCI Slot6.

IRQ 3 / IRQ 4 / IRQ5 / IRQ7 / IRQ 9 / IRQ 10 / IRQ 11 / IRQ 14 / IRQ 15

Available: Specified IRQ is available to be used by PCI/PnP devices.

Reserved: Specified IRQ is reserved for used by Legacy ISA devices.

The choice: Available, Reserved.

DMA Channel 0 / DMA Channel 1 / DMA Channel 3 / DMA Channel 5 / DMA Channel 6 / DMA Channel 7

Available: Specified DMA is available to be used by PCI/PnP devices.

Reserved: Specified DMA is reserved for use by Legacy ISA devices.

The choice: Available, Reserved.

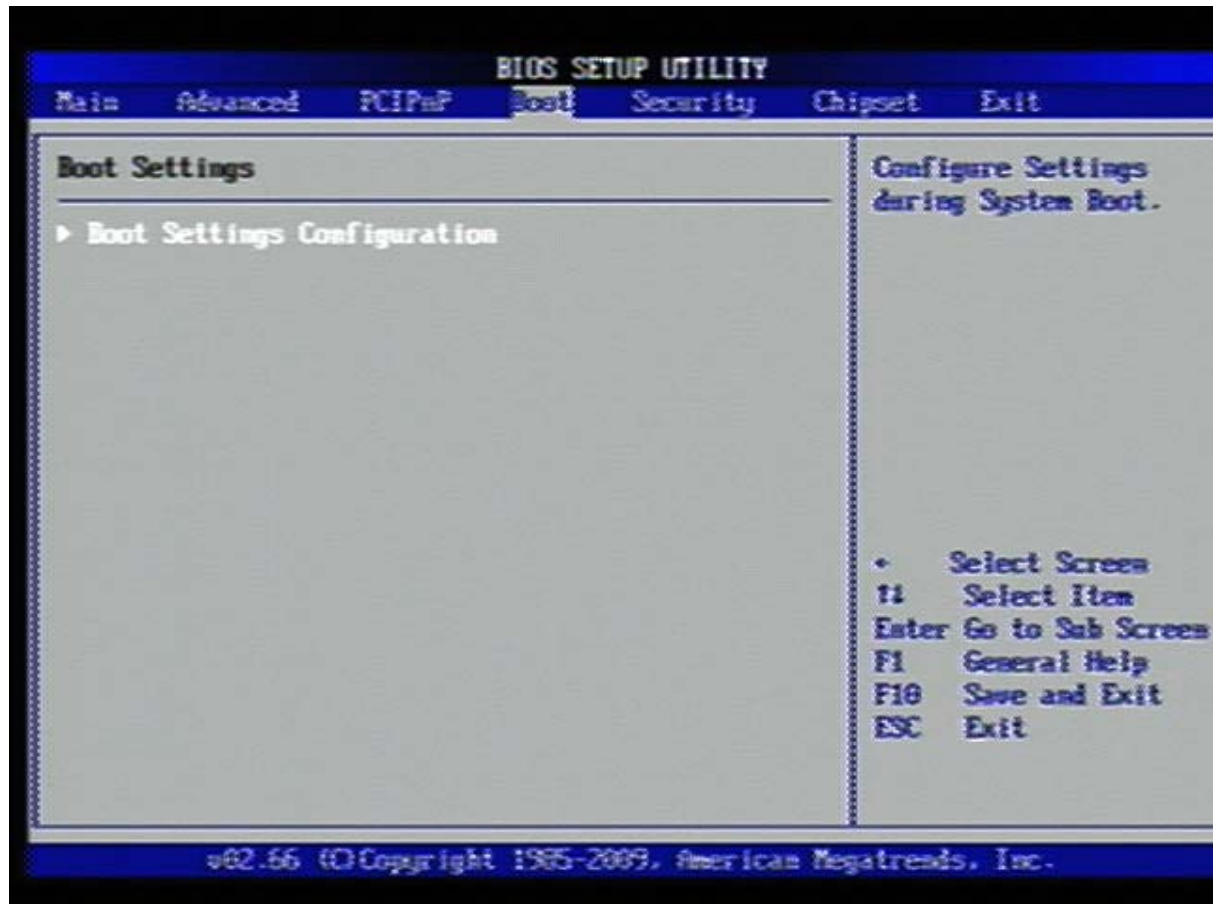
Reserved Memory Size

Select Size of memory block to reserve for legacy ISA devices.

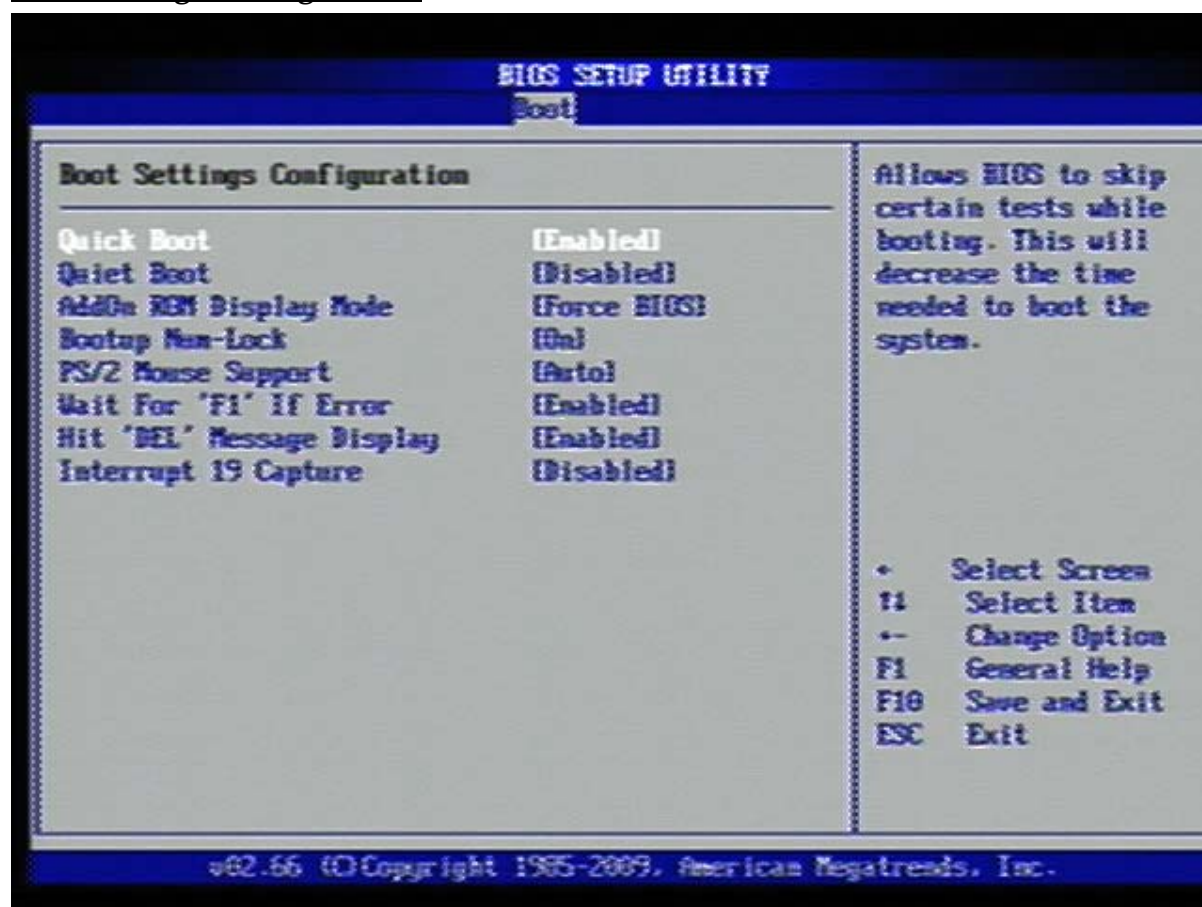
The choice: Disabled, 16K, 32K, 64K.

4.5 Boot

Use this menu to specify the priority of boot devices.



Boot Settings Configuration



Quick Boot

Enabling this setting will cause the BIOS power-on self test routine to skip some of its tests during boot up for faster system boot.

The choice: Disabled, Enabled.

Quiet Boot

This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo. When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages. When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.

Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, it is recommended that you disable this BIOS feature for a faster boot-up time.

The choice: Disabled, Enabled.

AddOn ROM Display Mode

This item is used to determine the display mode when an optional ROM is initialized during POST. When set to [Force BIOS], the display mode used by AMI BIOS is used. Select [Keep Current] if you want to use the display mode of optional ROM.

The choice: Force BIOS, Keep Current.

Bootup Num-Lock

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

The choice: Off, On.

PS/2 Mouse support

Select [Enabled] if you need to use a PS/2-interfaced mouse in the operating system.

The choice: Disabled, Enabled, Auto.

Wait For 'F1' If Error

When this setting is set to [Enabled] and the boot sequence encounters an error, it asks you to press F1. If disabled, the system continues to boot without waiting for you to press any keys.

The choice: Disabled, Enabled.

Hit 'DEL' Message Display

Set this option to [Disabled] to prevent the message as follows:

Hit Del if you want to run setup

It will prevent the message from appearing on the first BIOS screen when the computer boots. Set it to [Enabled] when you want to run the BIOS Setup Utility.

The choice: Disabled, Enabled.

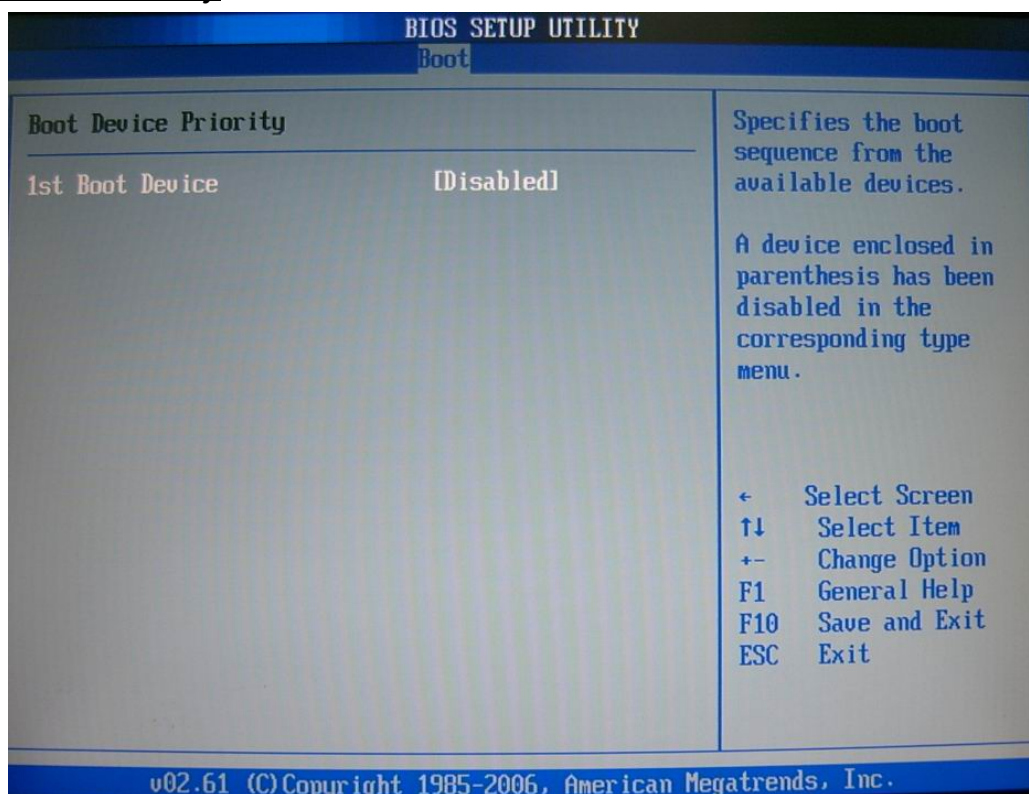
Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When enabled, this BIOS feature allows the ROM BIOS of these host adaptors to "capture" Interrupt 19 during the boot process so that drives attached to these adaptors can function as bootable disks. In addition, it allows you to gain access to the host adaptor's ROM setup utility, if one is available.

When disabled, the ROM BIOS of these host adaptors will not be able to "capture" Interrupt 19. Therefore, you will not be able to boot operating systems from any bootable disks attached to these host adaptors. Nor will you be able to gain access to their ROM setup utilities.

The choice: Disabled, Enabled.

Boot Device Priority

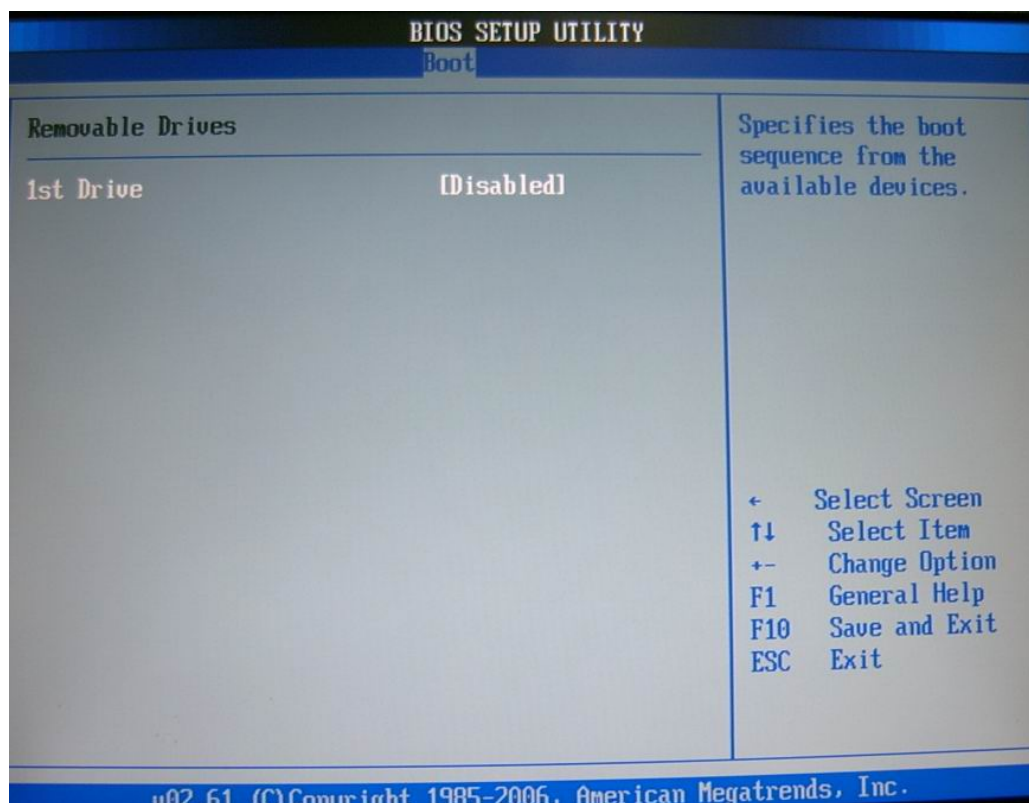


1st Boot Device

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

The choice: (Removable Dev.), Disabled.

Removable Drives



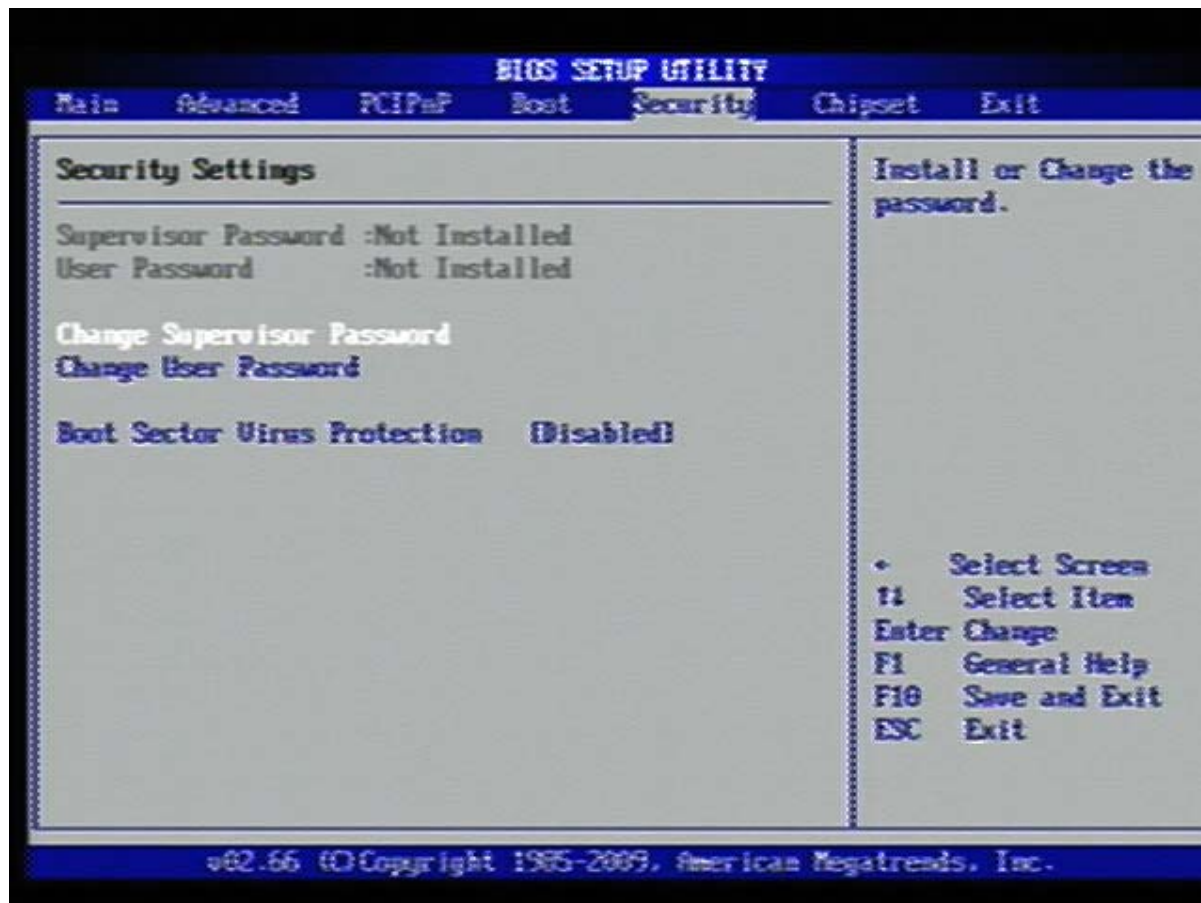
1st Drive

This setting allows users to set the priority of the removable devices. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

The choice: 1st FLOPPY DRIVE, Disabled.

4.6 Security

Use this menu to set supervisor and user passwords.



Supervisor Password / Change Supervisor Password

Supervisor Password controls access to the BIOS Setup utility. These settings allow you to set or change the supervisor password.

User Password / Change User Password

User Password controls access to the system at boot. These settings allow you to set or change the user password.

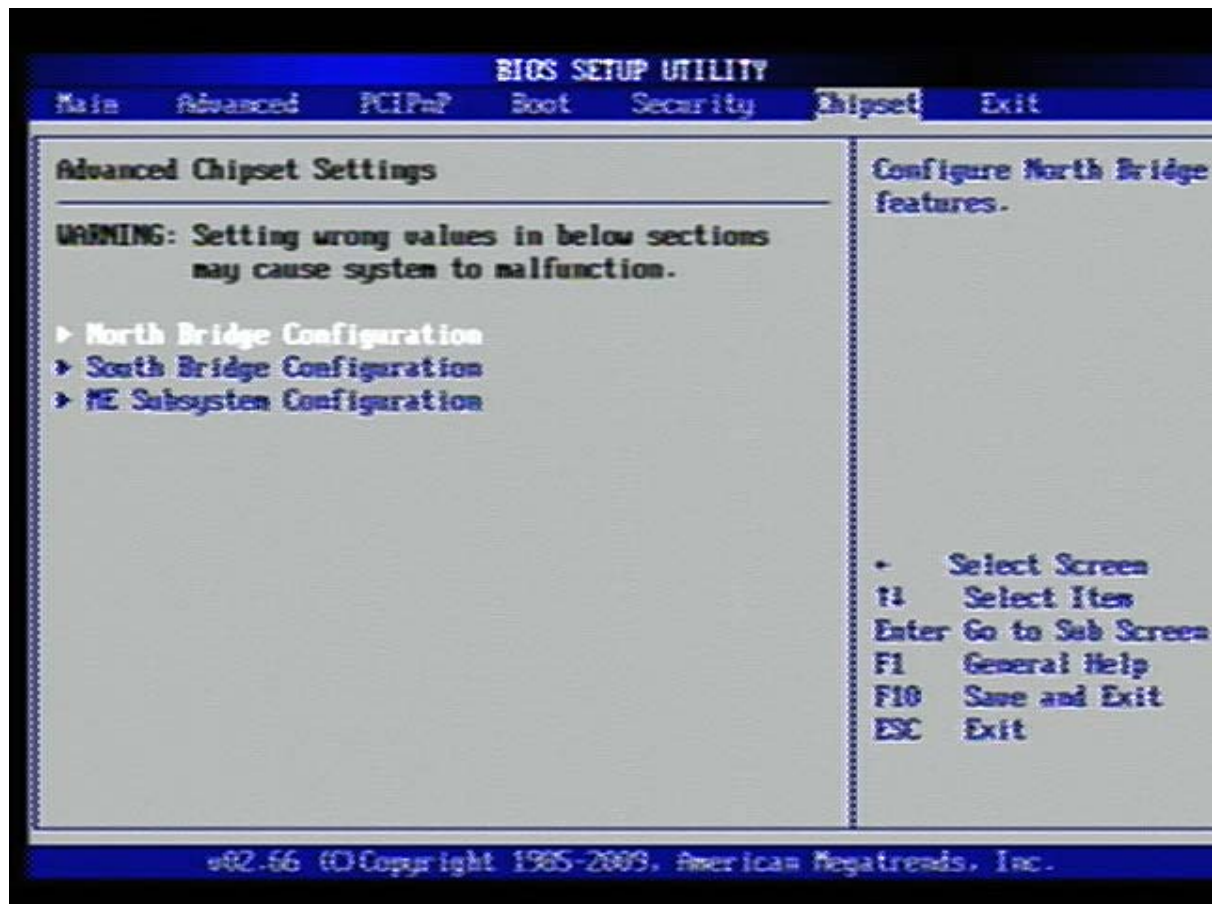
Boot Sector Virus Protection

Boot Sector Virus Protection.

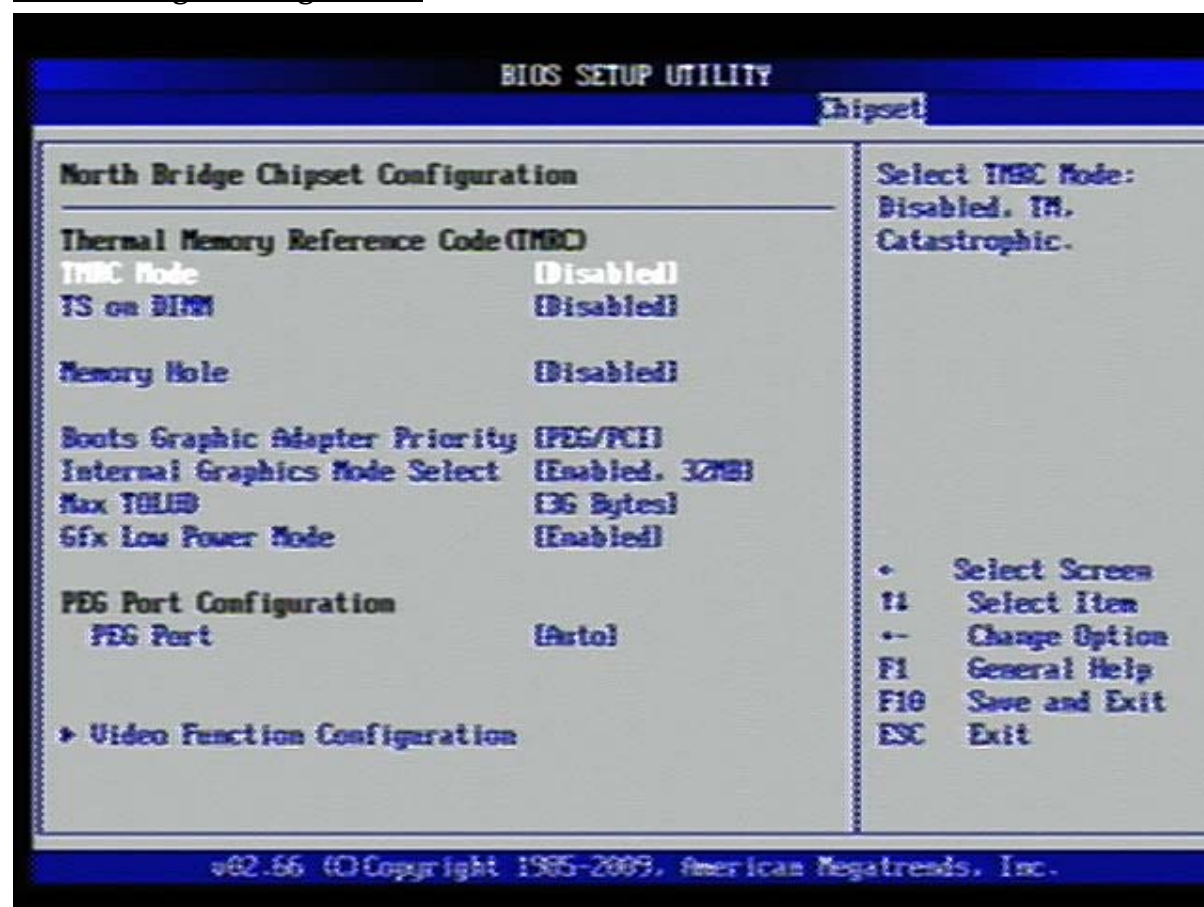
The choice: Disabled, Enabled.

4.7 Chipset

This menu controls the advanced features of the onboard Northbridge and Southbridge.



North Bridge Configuration



Memory Remap Feature

Enabled: Allow remapping of overlapped PCI memory above the total physical memory. Disabled: Do not allow remapping of memory.

The choice: Disabled, Enabled.

DRAM Frequency

Users are recommended to use Auto for memory frequency selection.

The choice: Auto, 533, 667, 800, 1067 MHz.

Configure DRAM Timing by SPD

This option provides DRAM plug-and-play support by serial presence detect (SPD) mechanism via the system management bus (SMBUS) interface.

The choice: Disabled, Enabled.

Memory Hole

In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB.

The choice: Disabled, 15MB-16MB.

Initiate Graphic Adapter

Select which graphics controller to use as the primary boot device.

The choice: IGD, PCI/IGD, PCI/PEG, PEG/IGD, PEG/PCI.

Internal Graphics Mode Select

Select the amount of system memory used by the internal graphics device.

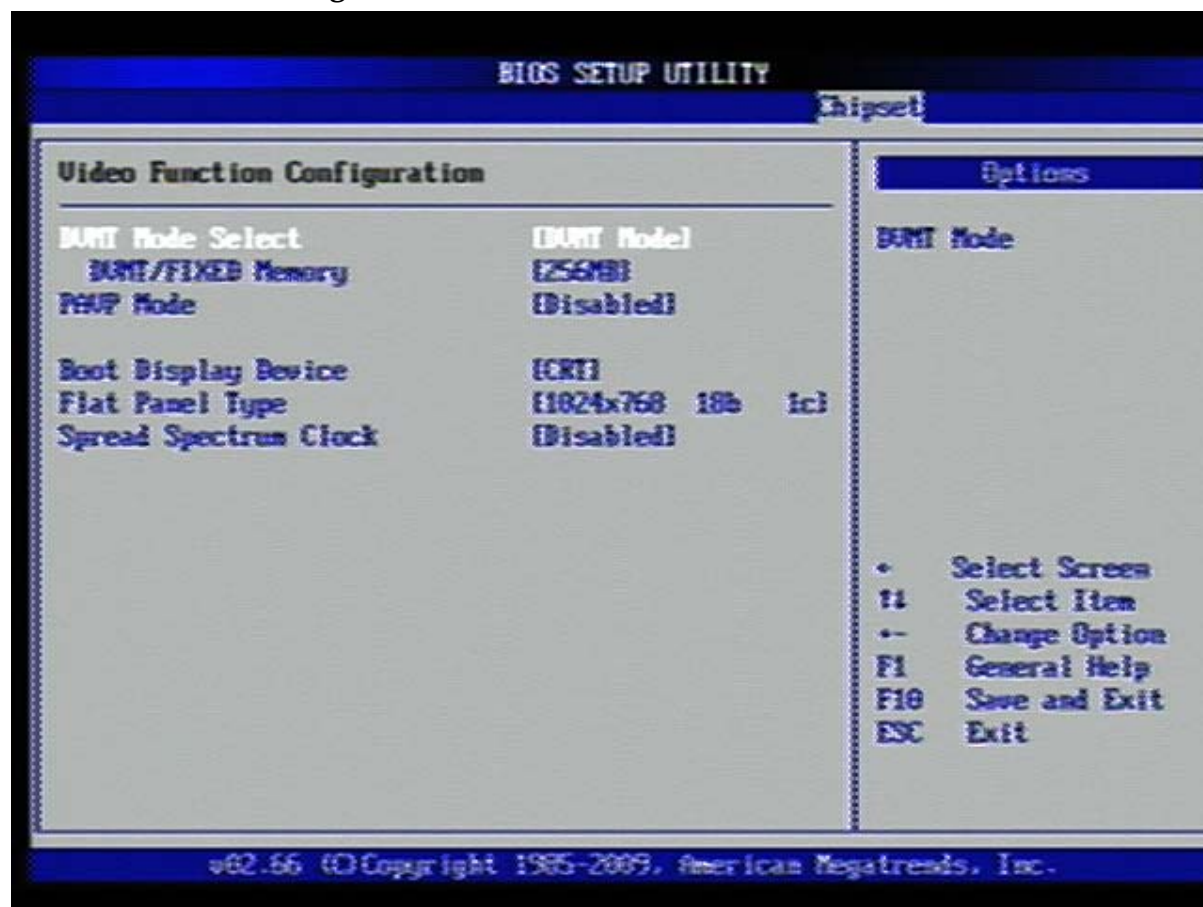
The choice: Enabled, 32MB, Enabled, 64MB, Enabled, 128MB.

PEG Port

This setting allows you to select whether to use the on-chip graphics processor or the PCI Express card. When set to [Auto], the BIOS checks to see if a PCI Express graphics card is installed. If it detects that a PCI Express graphics card is present, the motherboard boots up using that card. Otherwise, it defaults to the onboard graphics processor.

The choice: Auto, Disabled.

Video Function Configuration



DVMT Mode Select

Intel®'s Dynamic Video Memory Technology (DVMT) allows the system to dynamically allocate memory resources according to the demands of the system at any point in time. The key idea in DVMT is to improve the efficiency of the memory allocated to either system or graphics processor.

It is recommended that you set this BIOS feature to DVMT Mode for maximum performance. Setting it to DVMT Mode ensures that system memory is dynamically allocated for optimal balance between graphics and system performance.

The choice: Fixed Mode, DVMT Mode.

DVMT/FIXED Memory

When set to DVMT/FIXED Mode, the graphics driver will allocate a fixed amount of memory as dedicated graphics memory, as well as allow more system memory to be dynamically allocated between the graphics processor and the operating system.

The choice: 128MB, 256MB.

Boot Display Device

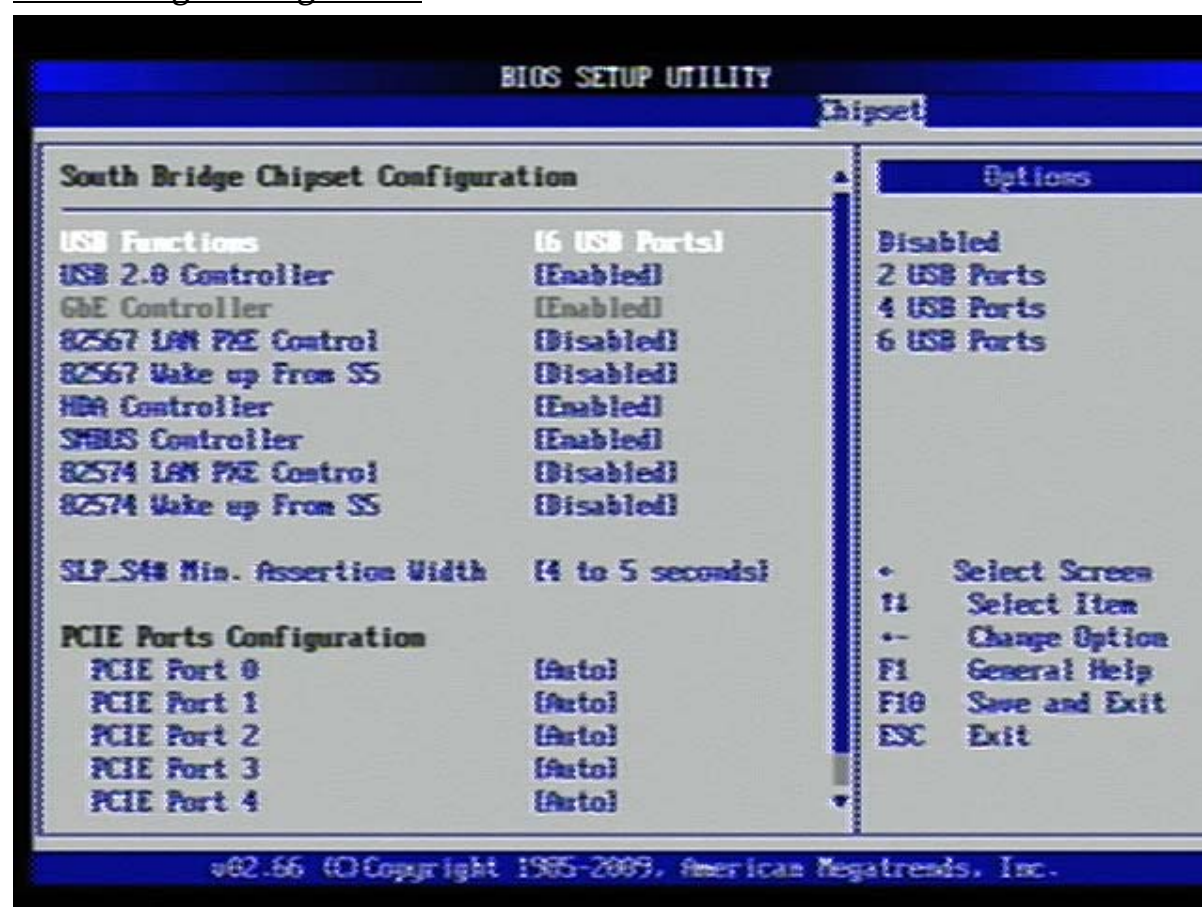
Use the field to select the type of device you want to use as the display(s) of the system.

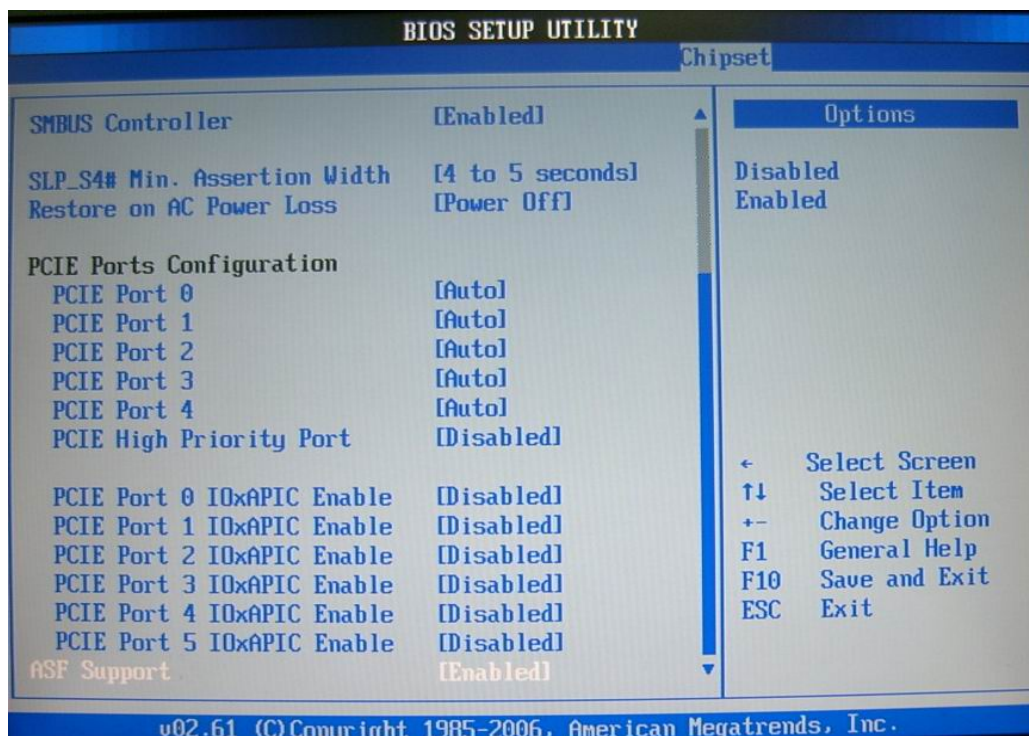
The choice: CRT, SDVO, CRT+SDVO, LVDS, CRT+LVDS on Port 0.

Spread Spectrum Clock

The choice: Disabled, Enabled.

South Bridge Configuration





USB Functions

This setting specifies the function of the onboard USB controller.

The choice: Disabled, 2 USB Ports, 4 USB Ports, 6 USB Ports, 8 USB Ports, 10 USB Ports, 12 USB Ports.

USB Port Configure

The choice: 6x6 USB Ports, 8x4 USB Ports.

USB 2.0 Controller

Set to [Enabled] if you need to use any USB 2.0 device in the operating system that does not support or have any USB 2.0 driver installed, such as DOS and SCO Unix.

GbE Controller

This setting Enable the onboard Gigabit Ethernet controller.

GbE LAN Boot

When [Enabled], the BIOS attempts to boot from a LAN boot image before it attempts to boot from a local storage device.

The choice: Disabled, Enabled.

82574 Wake Up From S5

This field specifies whether the system will be awakened from the S5 power saving mode when activity or input signal of onboard LAN is detected.

The choice: Disabled, Enabled.

HDA Controller

This setting controls the High Definition Audio interface integrated in the Southbridge.

The choice: Disabled, Enabled.

SMBUS Controller

The choice: Disabled, Enabled.

SLP_S4# Min. Assertion Width

The choice: 4 to 5 seconds, 3to 4 seconds, 2 to seconds, 1 to 2 seconds.

Restore on AC Power Loss

This item allows user to configure the power status of using ATX power supply after a serious power loss occurs.

The choice: Power Off, Power On, Last State.

PCIE Port 0 / PCIE Port 1 / PCIE Port 2 / PCIE Port 3 / PCIE Port 4

The choice: Auto, Disabled, Enabled.

PCIE High Priority Port

The choice: Disabled, Port 0, Port 1, Port 2, Port 3, Port 4, Port 5.

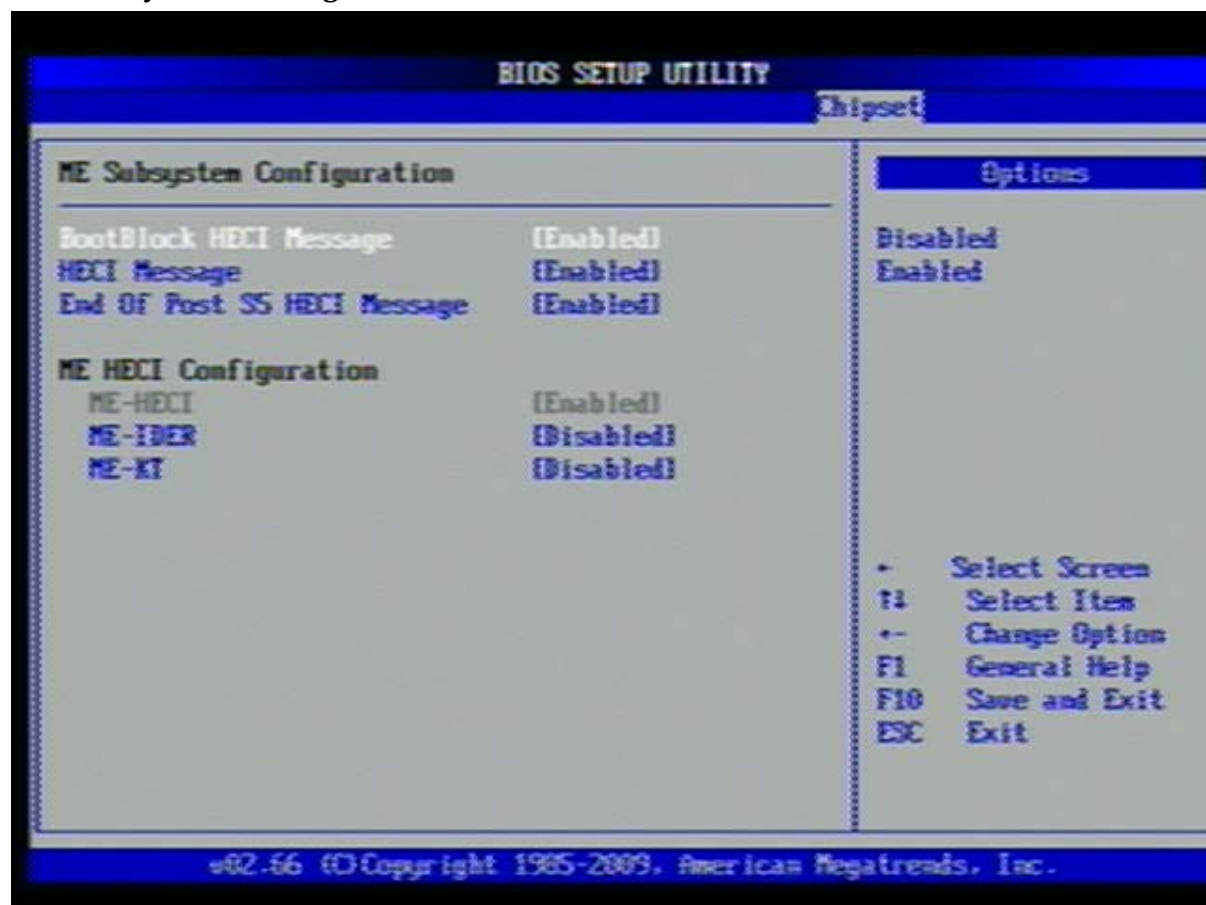
PCIE Port 0 / PCIE Port 1 / PCIE Port 2 / PCIE Port 3 / PCIE Port 4 / PCIE Port 5 IOxAPIC Enabled

The choice: Disabled, Enabled.

ASF Support

The choice: Disabled, Enabled.

ME Subsystem Configuration



BootBlock HECI Message

The choice: Disabled, Enabled.

HECI Message

The choice: Disabled, Enabled.

End Of Post S5 HECI Message

The choice: Disabled, Enabled.

ME-IDER

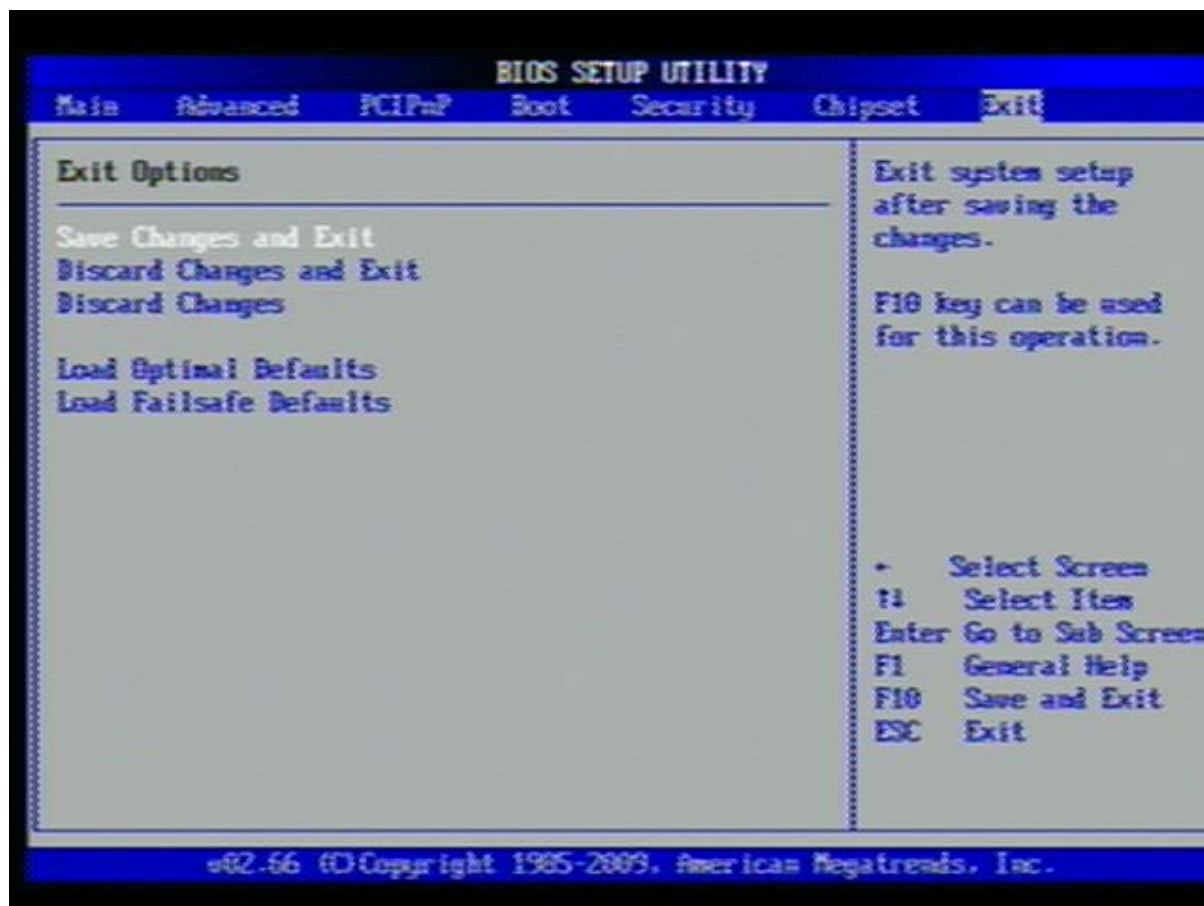
The choice: Disabled, Enabled.

ME-KT

The choice: Disabled, Enabled.

4.8 Exit

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.



Exit Saving Changes

Exit System Setup and save your changes to CMOS. Pressing <Enter> on this item asks for confirmation: Save changes to CMOS and exit the Setup Utility.

Discard Changes and Exit

Abandon all changes and exit the Setup Utility.

Discard Changes

Abandon all changes and continue with the Setup Utility.

Load Optimal Defaults

Use this menu to load the default values set by the SBC manufacturer specifically for optimal performance of the SBC.

Load Failsafe Defaults

Use this menu to load the default values set by the BIOS vendor for stable system performance.

Chapter 5

Troubleshooting

This chapter provides a few useful tips to quickly get ROBO-8719 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

Backplane

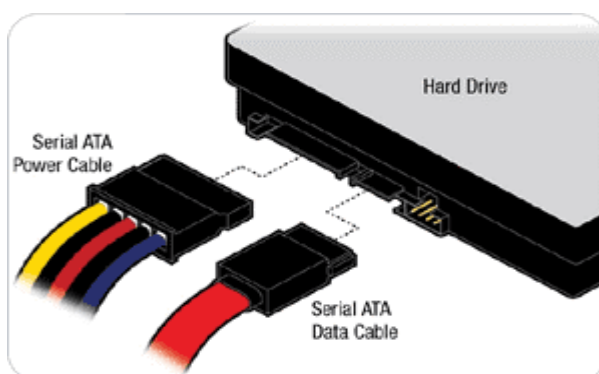
ROBO-8719 is a full-sized Signal Board Computer, and therefore is only able to run on PICMG 1.0 backplane. To know whether your backplane is PICMG 1.0 backplane, please contact with vendor or manufacturer.

P4 Power connector

The CPU supplementary Power Connector (J3) has to be connected to a system all the time no matter using ATX mode. Otherwise, the system won't boot up properly.

Serial ATA Hard Disk employment

Each Serial ATA channel can only connect to one SATA hard disk at a time; there are total four connectors, J18/J19/J21. The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation. All you need to do is to plug in two cables and enable SATA in System BIOS.



5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. CPU, CPU Fan, 240-pin DDR2 SDRAM, keyboard, mouse, floppy drive, IDE hard disk, printer, VGA connector, device cables, ATX accessories or 12V 4-pin power cable are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with ROBO-8719 series, it is recommended, when going with the boot-up sequence, to hit “DEL” key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to “**Load Optimal Defaults**”, press “Enter” and “Y” to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS => Standard CMOS setup menu, pick up any one from Primary/Secondary Master/Slave IDE ports, and press “Enter”. Setup the selected IDE port and its access mode to “Auto”. This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the floppy drive, COM1/COM2 ports, Parallel port, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

Disable COM1 serial port to release IRQ #4
 Disable COM2 serial port to release IRQ #3
 Disable Parallel port to release IRQ #7
 Disable PS/2 mouse to release IRQ #12,
 Etc...

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System Timer
IRQ #1	Keyboard Event
IRQ #2	Usable IRQ
IRQ #3	COM2
IRQ #4	COM1
IRQ #5	Usable IRQ
IRQ #6	Diskette Event
IRQ #7	Usable IRQ
IRQ #8	Real-Time Clock
IRQ #9	Usable IRQ
IRQ #10	Usable IRQ
IRQ #11	Usable IRQ
IRQ #12	IBM Mouse Event
IRQ #13	Coprocessor Error
IRQ #14	Hard Disk Event
IRQ #15	Usable IRQ

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

5.3 FAQ

Unboot problem

Symptom: SBC keeps beeping, and no screen has shown.

Solution: In fact, each beep sound represents different definition of error message. Please refer to table as following:

Beep sounds	Meaning	Action
One long beep with one short beeps	DRAM error	Change DRAM or reinstall it
One long beep constantly	DRAM error	Change DRAM or reinstall it
One long beep with two short beeps	Monitor or Display Card error	Please check Monitor connector whether it inserts properly
Beep rapidly	Power error warning	Please check Power mode setting

Symptom: There is neither no beeps nor screen output.

Solution: Indeed, you can do the stand-alone to identify the root cause by isolating the board from other possible system devices such as PCI device, backplane, and so on. If the system still cannot boot up, please fill out RMA from which is provides on Portwell website, and then send back to Portwell as a RMA. Besides, you also visit RMA site (<http://www.portwell.com.tw/rma/login.asp>) to check RMA report if necessary.

Information & Support

Question: Intel® GM45 Chipset supports Dual Channel Mode, but how can I enable this function?

Answer: Indeed, you don't have to change any setting. You can simply plug DDR2 SDRAM Module on DIMMs, and then system will automatically enable Dual Channel Mode.

Question: What kind of CPU supports Hyper-Threading?

Answer: All FSB 1066/800/533 MHz series CPU support Hyper-Threading mode.

Question: Why cannot I install USB 2.0 driver?

Answer: If you are using Windows 2000, you need to update your Service-Pack version to Service-Pack 4. If you are using Windows XP, you need to update Service-Pack to Service Pack 1 at least.

To solve this problem, you can download BIOS from our website
<http://www.portwell.com.tw/download.asp>

If you cannot find BIOS that you need, please contact with Technical Support Department to request a new BIOS to solve this problem.
Technical Support Department
Mailto: tsd@portwell.com.tw

Question: I forget my password of system BIOS, what am I supposed to do?

Answer: You can simply short 2-3 pins on JP4 to clean your password.

Note:

Please visit our technical web site at

<http://www.portwell.com.tw>

For additional technical information is not covered in this manual.

System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used.

Memory Area	Size	Device Description
000-003F	1K	Interrupt Area
0040-004F	0.3K	BIOS Data Area
0050-006F	0.5K	System Data
0070-0E2E	54K	DOS
0E2F-0F6B	5K	Program Area
0F6C-9B7F	560K	[Available]
First Meg -- Conventional memory end at 636K --		
9B80-9BBF	1K	Extended BIOS Area
9BC0-9FFF	17K	Unused
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CFDF	63K	Video ROM
CFE0-EFFF	128K	Unused
F000-FFFF	64K	System ROM

Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

IRQ#	Current Use	Default Use
IRQ 0	System ROM	System Timer
IRQ 1	System ROM	Keyboard Event
IRQ 2	Unassigned	Usable IRQ
IRQ 3	System ROM	COM2
IRQ 4	System ROM	COM1
IRQ 5	Unassigned	Usable IRQ
IRQ 6	System ROM	Diskette Event
IRQ 7	Unassigned	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	Unassigned	Usable IRQ
IRQ 10	Unassigned	Usable IRQ
IRQ 11	Unassigned	Usable IRQ
IRQ 12	System ROM	IBM Mouse Event
IRQ 13	System ROM	Coprocessor Error
IRQ 14	System ROM	Hard Disk Event
IRQ 15	Unassigned	Usable IRQ